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The Sustainability of Intensive Comprehensive Aphasia Programs: A Qualitative Study

By

Katie Jo Roberts

A thesis

submitted in partial fulfillment

of the requirements for the degree of

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RE: Study Number IRB-FY2021-270: Qualitative Analysis of Established Intensive
Comprehensive Aphasia Programs

Dear Dr. Scharp:

I agree that this study qualifies as exempt from review under the following guideline: Category 2.(i). Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording).

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Sincerely,

Ralph Baergen,
PhD, MPH, CIP
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The Sustainability of Intensive Comprehensive Aphasia Programs: A Qualitative Study

Thesis Abstract--Idaho State University (2022)

Aphasia is a language disorder that commonly occurs from a stroke. Intensive Comprehensive Aphasia Programs (ICAPs) align with the World Health Organization's International Classification of Functioning, Disability and Health recommendations by providing intensive therapy in individual and group settings for a cohort of individuals with aphasia. While ICAPs are effective, there are challenges to implementing and sustaining an ICAP. This study sought to understand the characteristics of sustained ICAPs from the perspective of international aphasiologists involved in an ICAP. Interviews were coded and analyzed for common themes and subthemes. Three major themes related to supports for sustainability emerged; operationalizing program procedures, making continual intentional programmatic improvements, and the need for passion and commitment to the ICAP model. Four major barrier themes to sustainability emerged; limitations in the research base, resource restrictions, issues of program accessibility, and programmatic funding challenges and economics of healthcare. These major themes and subthemes are discussed.

Keywords: Aphasia; Intensive Comprehensive Aphasia Program (ICAP); Sustainability

Introduction

Aphasia

Every forty seconds someone has a stroke in the United States (Centers for Disease Control and Prevention [CDC], 2020) and stroke is a leading cause of disability (Virani et al., 2020). One lesser known disability occurring in up to 40% of stroke survivors is aphasia (Mitchell et al., 2020). Aphasia is a language disorder that most commonly occurs from a left hemisphere infarct. Aphasia impairs an individual's ability to access the language enabling them to express themselves and is characterized by significant word finding issues, or anomia. This acquired language disorder is not due to an intellectual, sensory or motor impairment and impacts an individual's ability to both understand and use oral and written language (Hallowell, 2017). Furthermore, aphasia has been shown to be among the most detrimental disorders to an individual's health-related quality of life (Lam et al., 2010).

There are two general categories of aphasia; nonfluent and fluent, typically associated with damage to different general areas of the brain. Fluent aphasia is characterized by an ability to speak more readily, but the speech output makes little sense as it largely consists of jargon, perseverations and paraphasias. Individuals with fluent aphasia are typically unaware of their errors. In contrast, nonfluent aphasia is characterized by more effortful speech, often sounding telegraphic, agrammatic, and frequently contains abnormal pauses. Individuals with nonfluent aphasia are typically more aware of their errors (U.S. Department of Health and Human Services, 2015). Important to note, these two general classifications can be over simplified, as the presentation of aphasia differs across individuals (Hallowell, 2017). Severity and other comorbidities also play an important role in an individual's specific communication profile (Hallowell, 2017). Furthermore, the fluent versus nonfluent classifications do not indicate the

intelligibility of an individual's speech or how their communication impacts their quality of life, or daily social and environmental interactions (Hallowell, 2017).

Aphasia Treatment

While research consistently confirms that individuals with aphasia can make continued progress years after onset and that aphasia therapy is efficacious (e.g., Allen et al., 2012; Engel-Yeger et al., 2018; Hope et al., 2017; Johnson et al., 2019; Teasell et al., 2012), no cure currently exists for aphasia and treatment options in the chronic stage of aphasia often only treat a single specific area of impairment (Albert et al., 1973; Beeson, 1999; Beeson et al., 2002; Cherney et al., 1986; Helm-Estabrooks, et al., 2000; Rogalski & Edmonds, 2008). This is problematic as treatment across communication domains is important for life participation, activities of daily living, and overall quality of life (Cicerone et al., 2011). In the last decade, a novel approach called an Intensive Comprehensive Aphasia Program, or ICAP, was established to provide treatment that aligns with evidence-based recommendations for individuals with aphasia. ICAPs, as their name indicates, are comprehensive in the domains treated, including life participation, language impairment and family education. Additionally, the program draws on principles of neuroplasticity by providing therapy at a greater intensity than traditional aphasia treatment (Mohr, 2017). Specifically, ICAPs must have at least three hours of therapy provided per day for at least two weeks. Intensity is an important component of ICAPs as higher intensity therapy has been shown to have better outcomes for individuals with aphasia (Brady et al., 2016; Teasell et al., 2012). Additionally, ICAPs are unique in that they have a cohort of stroke survivors enter and progress throughout the program together. Intensive treatment using language in social interactions (i.e. group therapy), in contrast to drilling or massed practice treatment alone, results

in better outcomes for individuals with aphasia (Stahl et al., 2016). The cohort design of ICAPs facilitates these social interactions and relationship building (Griffin-Musick et al., 2020).

Review of the Literature

Emergence of ICAPs

Prior to the first published research on ICAPs in 2013, Worrall and colleagues (2011) recommended that the goals of individuals with aphasia need to guide treatment principles. Following in-depth interviews with 50 individuals with aphasia, the authors outlined common categories of goals aligning with the World Health Organization's International Classification of Functioning, Disability and Health (WHO-ICF) (Worrall et al., 2011). Goals included desires to recover impaired communication, more information on aphasia, treatment relevant to their personal lives, increased independence, and increased participation in the social, leisure and work aspects of life (Worrall et al. 2011). In an additional study exploring family members' goals from aphasia therapy, it was reported that they desired to be included in therapy and to be provided more information on aphasia and how they could support their loved one with aphasia (Howe et al., 2012). The comprehensive ICAP design promotes the goals and wishes of both the individuals with aphasia and their family members.

Further, investigations on aphasia treatment revealed there is an evidence gap in treatment applications for populations of individuals with aphasia. Specifically, there are gaps on intensity or dose of treatment (Code & Petheram, 2011; Gunning et al., 2017), a lack of education for the individuals with aphasia (Rose et al., 2009), and lack of communication partner training and education (Chang et al., 2018; Rose et al., 2019). Treatment does not align with evidence-based guidelines for a variety of reasons, including environmental barriers and personal

beliefs (Shrubsole et al., 2019). The structure of ICAPs specifically addresses these evidence-based gaps in aphasia rehabilitation.

Critically, ICAPs were designed to align with the WHO-ICF model. The WHO-ICF considers individuals more holistically by addressing not only their impairments, but also their health condition, body structure and functioning, activities and life participation, and environmental and personal factors. Aphasia treatment aligning with this model targets multiple domains and includes partner or caregiver education (Simmons-Mackie & Kagan, 2007). In summary, ICAPs were designed to provide comprehensive treatment, to include family and caregiver education, to infuse technology practice, to bridge the evidence to practice gap, and to target both life participation and linguistic impairments through evidence-based treatment approaches.

In 2013, Rose and colleagues conducted a survey on ICAPs to explore current practices and core features from around the globe. The 2013 survey found that while ICAPs were present in multiple countries, they were still a rare service delivery model, and the authors cited the need for further research into their efficacy and cost effectiveness. Rose and colleagues also developed a definition of ICAPs that has persisted since that report. The authors defined an ICAP as (1) having at least three hours of treatment per day for two weeks, (2) must be comprehensive, (3) includes family/caregiver education, (4) incorporates individual and group therapy that targets both life participation and communication impairments and (5) consists of a cohort of individuals who must begin and end the ICAP together (Rose et al., 2013).

Just recently the first scoping review on ICAPs was conducted with the primary aim of understanding what constitutes an ICAP (Monnelly et al., 2021). This review identified gaps in the research and called for a stronger justification of the ICAP design. The authors found gaps in

the rationale for the ICAP model, including rationale for the components of the Rose and colleagues 2013 definition outlined previously. The review found that intensity was the strongest included rationale for the ICAP model, but it was often left unspecified. For example, not only does the total hours of treatment needs to be reported, but also dosage or intensity of treatments, and if multidisciplinary activities counted towards the reported intensity. The authors also indicated future research “systematically adding or subtracting ICAP elements in order to tease apart the essential components (Monnelly et al., 2021)” is necessary. Research studies on ICAPs need to better document the programs procedures to enable replication, including materials used, interprofessional activities, and more standardized details on dosage. It is important to note that publications on ICAPs rarely report on modifications made throughout the program and why such modifications were made, as well as overall program fidelity (Monnelly et al., 2021).

In 2013, Hula and colleagues described and outlined a research approach separated into four phases to guide future ICAP investigations. Phase I is for the proof-of-concept, feasibility and acceptability of ICAPs. In this phase, researchers primarily examine whether an expected treatment effect has occurred, or more simply, they investigate the proof-of-concept of ICAPs. This phrase also includes secondary aims such as finding optimal dosage, demonstration of feasibility of treatment, and effect size estimation. Proof-of-concept refers to the ability to provide evidence that a desired treatment effect can and has taken place. Research designs in this phase commonly include case studies, small pre-post experiments, single subject and group designs and retrospective investigations. Investigations on safety also commonly take place in this phase, however the risks to participants in ICAPs, aside from fatigue, are negligible. Currently, most published ICAP research are Phase I investigations.

While the bulk of the current research is in Phase I, there are varying numbers of ICAP investigations within Phases II, III and IV. Phase II is on the efficacy of ICAPs. Efficacy refers to a well-defined treatment and study of a population (not individuals) using trained clinicians, specifically selected participants, and by using the most appropriate outcome measures. Phase II studies often use a parallel group design or a randomized control group design. Phase III is for the effectiveness of ICAPs. Effectiveness, in contrast to efficacy, refers to investigations under typical clinical conditions. Effectiveness examines the generalizability of research and research in this phase preferably uses a randomized control design. Finally, Phase IV is for health services and research. Research in this phase seeks to understand if changes are needed to health care services, including cost effectiveness and cost benefits. This investigation on the sustainability of ICAPs is a Phase IV investigation as identifying the barriers and supports to ICAP sustainability is important to understand its viability as a clinical health model.

Since the Hula and colleagues 2013 research agenda and the Rose and colleagues 2013 international survey, research on ICAPs has grown substantially. As noted above, published ICAP research is primarily in Phase I, with only two Phase II studies completed (Dignam et al., 2015; Auclair-Ouellet et al., 2021). The first randomized clinical trial on ICAP effectiveness and cost effectiveness is underway and expected to be completed soon (Cherney, 2021). Below is a categorization of the current research under each phase of the Hula and colleagues (2013) research agenda.

Phase I: ICAP Proof-of-Concept

As an early investigation into ICAPs, Babbitt and colleagues (2013) conducted a qualitative pilot investigation on what clinicians ($n=7$) thought about working in an ICAP and how it differed from a traditional clinical setting. The seven clinicians from three different

ICAPs reported that the ICAP structure enabled them to feel they were doing their best work, see more progress with clients, develop deeper relationships with clients and their families, and to administer more in-depth therapy not possible in other settings. Ultimately, the authors found that clinicians reported working within an ICAP to be both rewarding and challenging, and that they appreciated the amount of progress made during the program, measured both in evaluations and in their client's accomplishments of personal goals.

Rodriguez and colleagues (2013) established an ICAP in Australia called Aphasia LIFT to explore the basic outcomes of an ICAP. Their cohort of 11 participants provided evidence that individuals in the chronic stage of aphasia can improve in both functional communication and communication-related quality of life activities following ICAP participation. However, they found that improvements for all participants were not maintained at follow-up 6-8 weeks after the ICAP. Despite this finding in an early small sample size investigation, research on ICAPs continued to explore proof-of-concept of the rehabilitation program model. A retrospective study comparing two ICAPs, one based in Canada ($n=71$), and the other in Michigan ($n=44$), found that for most participants ICAPs are effective, as measured by objective language testing (Persad et al., 2013). These findings were consistent regardless of age, gender or time post onset (Persad et al., 2013). Likewise, a Boston, Massachusetts based ICAP ($n=20$) investigated not only ICAP outcomes, but specific outcomes following integration of an iPad into their ICAP (Hoover & Carney, 2014). The authors concluded that an iPad can successfully be integrated into an ICAP in a clinical setting (Hoover & Carney, 2014). This same program ($n=27$) later investigated outcomes with integration of interprofessional services (Hoover et al., 2017). Positive outcomes resulted from this interdisciplinary ICAP design that included speech therapy, occupational therapy, physical therapy and nutrition services (Hoover et al., 2017). An additional retrospective

five-year study on an ICAP also found interprofessional incorporation (occupational therapy, speech-language therapy, music therapy, etc.) is an effective option for individuals with moderate to severe aphasia (Nicholas et al., 2021). Similarly, in 2018 Escher and colleagues further investigated the outcomes and feasibility of integrating occupational therapy into an ICAP ($n=19$). Their findings support the inclusion of occupational therapy services to support the achievement of functional gains to increase life participation for individuals with chronic aphasia.

Winans-Mitrik and colleagues further contributed to the research of ICAP efficacy (2014). Their ICAP, located in Pittsburgh, Pennsylvania, was unique by implementing a residential ICAP where participants lived together for the entire duration of the program instead of reconvening each day (Winans-Mitrik et al., 2014). Most participants ($n=23$) in this ICAP made significant improvements. Consistent with aforementioned investigations, in 2015 Babbitt and colleagues found that their ICAP in Chicago, Illinois yielded significant positive improvement for participants ($n=74$) with aphasia in both language impairments and in family and participation life participation measurements, with the largest effects observed in the language impairment measures.

ICAP proof-of-concept research has continued to become more focused. In 2018, Baliki and colleagues sought to understand the brain network properties that lead to improvements following ICAP participation ($n=8$). While the specific neural causes remain relatively obscure, the study found that improvements following an ICAP were in part connected to individuals' baseline neural connectivity properties. An ICAP in the United Kingdom ($n=46$) found significant gains in both language abilities, especially speech production, and functional

communication measures both immediately after the program and at follow-up three months later (Leff et al., 2021).

In a Montana university-based setting ($n=37$; $n=53$), a group of researchers investigated the psychosocial outcomes following an ICAP (Griffin-Musick et al., 2020; Griffin-Musick et al., 2021). Supervised graduate-level student clinicians administered the bulk of the care. This study found that not only were there significant improvements in psychosocial well-being for the participants with aphasia, but also that a university-based ICAP can be effective, and has certain advantages compared to other settings because of the offset of cost by incorporating student clinicians. This same program similarly found that interprofessional services, in the context of an ICAP, can help not only the individuals with aphasia, but also their caregivers (Off et al., 2019). This ICAP also conducted a telehealth interprofessional program and sought to understand the both the graduate student clinicians and the participants with aphasia perspectives of the program. The students reported positively on the interprofessional design within the ICAP. The individuals with aphasia cited a desire for increased opportunities to connect with one another and for additional communication practice (Kincheloe et al., 2022).

In summary, the growing body of ICAP research demonstrates that ICAPs are efficacious and can deliver positive outcomes in both quality of life and impairment domains. The research also indicates that ICAPs, while strictly defined within certain parameters (e.g. intensity), are also flexible in their ability to include elements such as iPads, include a variety of interprofessional health disciplines, be offered as a residential program, and use supervised graduate students as the primary treating clinicians.

Phase I: ICAP Feasibility and Acceptability

As a step towards making ICAPs clinically viable, it is important to not only investigate program effectiveness but also to understand feasibility. For the purposes of this review, feasibility is defined as the viability of a program's model. Research on ICAP feasibility has found that overall ICAPs are a clinically feasible treatment model. However, it remains unclear what precise clinical profiles respond best to participation in an ICAP or even many general aphasia treatments. Research has not yet definitively shown which subtypes of aphasia (e.g., fluent versus nonfluent), severity levels, gender, age, etc. respond best to particular aphasia treatments approaches, including aphasia rehabilitation within the ICAP model.

In a rehabilitation center ICAP located at Chicago, Illinois, Babbitt and colleagues investigated the specific characteristics that contributed to more significant outcomes following an ICAP, including aphasia subtype, gender, initial severity level and age ($n=74$) (Babbitt et al., 2015; Babbitt et al., 2016). The authors found age to be the only predictive factor to treatment responsiveness, with the younger group (mean=52.2 years) experiencing more significant outcomes than the older group (mean=59.8). Further, the authors found that about 11% of individuals with aphasia in their program did not respond to treatment at all (Babbitt et al., 2016). However, as the vast majority of participants did respond positively, they concluded that individualized comprehensive and intensive therapy provided in an ICAP can benefit a wide range of aphasia subtypes and severity levels. Or, in other words, ICAPs are a feasible model for most individuals with aphasia, but more investigations need to delve into which clinical profiles can achieve the strongest benefits from participation in an ICAP.

To further understand stakeholder perspectives of ICAPs, Babbitt and colleagues investigated the ICAP experiences of individuals with aphasia and their family or care partners through qualitative interviews (2021). Notably, participants consistently cited the exceptional

training and experience of the speech-language pathologists (SLPs) trained in the ICAP model in contrast to SLPs that administered more distributed treatments. Participants also cited that the ability to form relationships within their cohort was very valuable to their ICAP experiences. Specifically, regarding improvements in impairments during the ICAP, participants reported that they made general improvements in both communication and in their activities of daily living, such as ordering a cup of coffee. For individuals with aphasia and their families, ICAPs result in not only improvements in the impairment-level domains, but also, because of the cohort structures, more opportunities to build relationships between participants (Babbitt et al., 2021). Ultimately, this study shows that for individuals with aphasia, the most important stakeholders, ICAPs are a feasible option.

Phase II: ICAP Efficacy

Dignam and colleagues (2015) conducted the first study in Phase II ICAP efficacy research. This nonrandomized, parallel group pre-post test design ($n=34$) compared intensive and distributed treatment within the context of an Australian ICAP. The authors found that distributed treatment resulted in better impairment-based improvements on word retrieval measures, and functional outcome measures were comparable for both the intensive and distributed group. In other words, the findings from this small-scale preliminary study indicate that distributed therapy is better for improving impaired language as measured by the study's primary outcome measure, the Boston Naming Test (BNT). The BNT is a single domain confrontational test, and does not assess the areas of receptive language, written language, repetition abilities, etc. There were significant differences between groups both at immediately posttest ($p=0.04$) and follow-up ($p=0.002$). For functional communication measures, including the Communicative Effectiveness Index (CETI), Communication Confidence Rating Scale for

Aphasia (CCRSA), and Assessment of Living with Aphasia (ALA), distributed and intensive therapy were found to be equally beneficial in improving the quality of life for individuals with aphasia. These results should be interpreted with caution as the single primary outcome measure, the BNT, has been found to be flawed in its psychometric properties (Harry & Crowe, 2014).

Additionally, Auclair-Ouellet and colleagues (2021) conducted a retrospective pre-post study ($n=7$) that sought to understand both the outcomes of an ICAP using consensus aphasia research outcome measures (Wallace et al., 2018), and the effect of intensive naming treatment within the context of an ICAP. The study found that while the ICAP resulted in significant improvements at the group level for some of the language measures, there were no observable changes for measures of quality of life and functional communication. Some participants in the ICAP made communicative gains measured by various outcome assessments, but the finding was not stable across the group. The authors also found no significant differences between the intensive and distributed naming treatment delivery schedules (Auclair-Ouellet et al., 2021). No maintenance data was collected due to resource constraints, so it unclear if the lack of differences between schedules continued over time. The program explained additional factors of intensity need to be studied, including dosage, number of items targeted per session, and optimal time to increase treatment lists. The study also cites a need for larger scale studies to better understand what participant profiles are most likely to benefit from the ICAP service delivery model (Auclair-Ouellet et al., 2021).

Phase III: ICAP Effectiveness

As previously mentioned, a randomized controlled trial ($n=56$) is currently underway in Chicago, Illinois (Cherney, 2021). The study seeks to understand the cost effectiveness and efficacy of the ICAP model. The program administered 60 hours of intensive and comprehensive

treatment over the course of three weeks to the intervention group, while the control group received distributed treatment over the course of 15 weeks. The researchers hypothesize that both groups will have significant improvements in measures of communication skills, life participation, and health-related quality of life. The outcome measure assessments (WAB-R LQ, ALA, CCRSA, CETI) were administered pre-treatment, post-treatment and at three months follow-up. The authors also hypothesize that the intensive treatment group will make greater improvements than the distributed treatment group, potentially demonstrating that intensive treatment is more cost effective (Cherney, 2021).

Phase IV: ICAP Health Services Research - ICAP Sustainability

Although there is growing evidence that ICAPs are a viable and effective treatment model, there is now a growing need to investigate the sustainability of ICAPs. Early in the conception of ICAP research, Hula and colleagues cited the need to examine the barriers and facilitators to implementing an ICAP so that eventually “all people with aphasia can access an ICAP within their local health service (2013).” Implementation science, or transferring research findings into practice, is a vital step for increasing clinical access to ICAPs (Glasgow & Chambers, 2012; Power et al., 2020). Investigations on sustainability for aphasia interventions is an area of implementation science that is currently lacking (Power et al., 2020). Sustainability is important to investigate to avoid wasting valuable healthcare resources (Power et al., 2021).

As an important step in investigating ICAP sustainability, one qualitative investigation focused on the perceived barriers to providing more intensive services, including ICAPs, across six countries from the perspective of aphasia clinicians who were *not* involved in an ICAP (Trebilcock et al., 2019). This study provided information on what clinicians feel they need to be able to successfully provide intensive treatment, including intensive treatment within an ICAP.

The interviewed speech-language pathologists cited the importance of collaboration with other professionals and the availability of experienced staff to increase the comprehensiveness and intensity of aphasia services. They also cited the need of a strong evidence base that emphasizes the feasibility and benefits of higher intensity and more comprehensive treatment models (Trebilcock et al., 2019).

Recently a group of researchers developed an online platform for speech-language pathologists seeking to improve the comprehensiveness and intensiveness of their services (Trebilcock et al., 2021). This will likely help further the sustainability and ease of implementing ICAPs in more clinical settings. The online site, AphasiaNexus, will become publicly available upon further testing. AphasiaNexus includes a checklist for ICAP start-ups, success stories, training opportunities, therapy materials and more. As ICAPs are implemented worldwide, this web-based resource will support international collaboration among SLPs interested in forming and running an ICAP. (Trebilcock et al., 2021).

In 2021, a follow-up survey to the original Rose and colleagues 2013 survey was conducted to better understand the growth of ICAPs internationally (Rose et al., 2021). The updated survey found that ICAPs still provide treatment aligned with the WHO-ICF recommendations by including both impairment-based and functional life participation approaches to therapy. This survey also found that the number of ICAPs across the world have increased substantially over the past decade, with an increase from 13 respondents in 2013 to 29 respondents in 2021 (Rose et al., 2021). An additional and important contribution of this paper was the identification of modified ICAPs (mICAPs). A mICAP modifies only a single component of the rigid ICAP definition to qualify for this classification. For example, a mICAP may modify and reduce the program from two weeks to one week. This allows for the added

benefit of implementing an ICAP in areas where individuals have to travel great distances to the program and will have to stay in hotels or other potentially costly housing for the duration of the program. A need for mICAPs was realized early in ICAP research because of the intensive time, energy and resource demands that can make programs challenging to implement. These mICAPs were discovered to be relatively commonplace in the international survey on ICAPs in 2021. The survey revealed that 7 of the 29 respondents fell under the classification of mICAPs. An additional 14 of the respondents met the criteria for an ICAP. The remaining eight programs had two or more modifications, so did not fall under either classification. More research on mICAPs is necessary to explore to what extent a single well-defined component of ICAPs can be modified and still result in significant outcomes for persons with aphasia. (Rose et al., 2021).

Rose and colleagues also addressed the need for investigations on ICAP sustainability (2021). The survey observed that 25% of the original 2013 respondents were no longer operating at the time of the 2021 follow-up survey. Committed leaders and financial stability were identified as two main reasons for the cessation of these programs. Difficulties regarding financial stability was also addressed by Boyer and colleagues in 2017 in a cost analysis of ICAPs. The authors found that beginning an ICAP cost about \$15,300 per ten participants or about \$19,700 per six participants in the United States (Boyer et al., 2020). Additionally, in the United Kingdom one ICAP reported its costs to be about \$6,500 per patient (Leff et al., 2021). The most significant costs were the cost of personnel, such as the speech-language pathologists. Understanding affordability and the distribution of costs is crucial to both implementing and sustaining the ICAP model in rehabilitative care (Jordan & Deutsch, 2021).

Further, the 2021 survey identified the need for committed leaders to support ICAP sustainability (Rose et al.). Those who spearhead ICAPs are responsible for advocating for the

ICAP model, overseeing budget, and meeting staffing and facility requirements. The leader must also ensure the quality of services throughout the program. Sustainability of ICAPs is diminished when leaders must change their priorities or they have to retire from the program. Rose and colleagues recommend that future research investigate the challenges and barriers of closed ICAPs and the sustainability of ICAPs over time. This research project sought in part to answer that call for action by investigating international ICAP sustainability.

When conceptualizing sustainability of ICAPs, it is important to understand the parameters in which a program must be implemented to remain an ICAP. The core elements of the ICAP have been carefully and deliberately specified by highly trained and experienced aphasiologists. Thus, to remain an ICAP, a program must adhere to the key elements outlined in the Rose and colleagues 2013 study. That is, an ICAP must have a cohort, must be comprehensive, and must be sufficiently intensive. Otherwise, they may differ by only one element and be classified as a mICAP. Because of the importance of this definition, and for the purpose of this investigation, the sustainability of ICAPs and mICAPs is defined as the maintenance of each program's adherence to the core elements of the original ICAP definition (Shelton et al., 2018). The aim of this qualitative study is to explore, through semi-structured interviews and thematic analysis, the barriers and supports to ICAP implementation and the sustainability strategies of maintained ICAPs. Specifically, this investigation will seek to answer the following question: What are the characteristics of sustained ICAPs?

Methodology

Participants and Sampling

In this qualitative study, participants consisted of international ICAP program leaders that were recruited from the 2021 survey study (Rose et al.). A total of 21 ICAPs and mICAPs

responded to the 2021 Rose and colleagues survey, and all but two participants consented to be contacted for follow-up information. In the summer of 2021, purposive sampling was used to contact the consented participants individually by email (Oppong, 2013). The emails requested participation in this study on “the barriers and facilitators to ICAP sustainability” and provided information on the expected format (e.g., videoconferencing) and time expectations for the interviews. After several rounds of follow-up emails, a total of eight participants from seven ICAPs returned the informed consent forms and agreed to participate in an interview. Interviews were conducted during the summer and fall of 2021. To preserve anonymity, programs were given a code name with an assigned number and letter based upon regional European (E) or North American (NA) location. One program (N3) had two different interviewees as the person primarily overseeing the ICAP had recently changed, and some questions needed to specifically capture the insight of the individual who was involved in the program in its early days.

Table 1 provides participant and ICAP demographics (collected from Rose et al., 2021 survey data) along with the Therapeutic Intensity Ratio (TIR) for each program to compare intensiveness across ICAPs/mICAPs (Babbitt et al., 2015). TIR is found by multiplying hours of treatment per day by the number of treatment days per week by the number of weeks the program ran. This output is then divided by the number of weeks the program ran times 40 (e.g., the number of hours in a standard work week) and converted to a percent. For example, E1 ran for 8 hours per day for 5 days per week for 3 weeks ($8*5*3=120$) and 3 weeks times 40 hours ($3*40=120$), which produces a TIR of 100% ($120/120=1*100=100\%$).

Table 1: ICAP Demographics

Program	General Location	Total Years Running	Number of Cohorts per year	Cohort Size	Therapeutic Intensity Ratio (TIR)	Utilization of Graduate Students?
E1	Europe	37	29	3	93.8%	yes
E2	Europe	12	5	6	100%	sometimes
E3	Europe	4	2	8	62.5%	sometimes
N1	North America	12	3	3	23.4%	sometimes
N2	North America	4	1	9	37.5%	yes
N3	North America	5	3	5	60%	yes
N4	North America	5	12	2	37.5%	no

Some data was collected from 2021 quantitative study (Rose et al., 2021)

Instrumentation

Two ICAP/mICAP researchers from the Rose et al., 2021 study designed the interview questions. The questions included in the interviews were developed to gather information in three primary areas: 1) motivation for implementing the program, 2) logistics of the program, and 3) plans for future modifications or past modifications. These questions were designed to understand what events or characteristics allowed the ICAP to be successfully implemented, and how it was sustained over time. Supplementary follow-up questions were included to elicit fuller responses as necessary. See Appendix A for the full survey script used to conduct the interview for each participant. Previous investigations in aphasia research have commonly examined sustainability through interviews on clinicians' perspectives on implementation and ongoing barriers (Power et al., 2020). The semi-structured interview design helped guide and create consistency across interviews, but also allowed for unrestricted responses from participants.

Procedures

Data collection occurred in individual interviews conducted in English through the Zoom video conferencing platform (Zoom Video Communications, 2020). Zoom's recording and

automatic transcription features were used to collect both video and audio recordings and whole word transcriptions from each interview. Online interviews are reported to be identical in quality as face-to-face interviews (Gray et al., 2020; Hanna, 2012). Interview recordings ranged from 25 to 58 minutes (mean=39 minutes). Sessions were conducted by a trained female second year speech-language pathology graduate student with an experienced aphasia PhD researcher present for all but two of the interviews due to scheduling conflicts. There had been no prior correspondence with the primary interviewer and the interviewees prior to the recruitment emails.

Automatic transcripts from the interviews were titled by the location of the program and uploaded to a secure storage platform. Transcripts were reviewed side-by-side with the interview recording to correct words that were incorrectly transcribed by the automatic software (Chia, 2020). Distracting speech fillers were removed from the transcripts (i.e., “um”, “uh”, “like”) and correct punctuation was added to increase readability. Each transcription was corrected and checked for intrrater-reliability by one researcher, and 50% of the transcripts were interrater reliability checked by a four-person student team from the University of Montana trained by a skilled aphasiologist. Prioritized transcripts for interrater reliability procedures were the international-residing participants who presented with differences in dialect, so the automatic Zoom software was prone to more errors. Percent agreement between the independent transcriber and the transcription team averaged 98% agreement. Transcripts were then organized by question to facilitate ease of identifying and assigning thematic codes during analysis. Some questions were not asked of every participant, typically because of the nature of their program (i.e., a program that did not include student clinicians was not asked to describe their student training procedures). Subsequently, some questions had more responses than others. Transcripts

were checked alongside the videos one final time to ensure no content was lost due to the readability changes. Then each transcript was uploaded to Dedoose, a qualitative data management and analysis software system, for coding and analysis (SocioCultural Research Consultants, 2018).

Data Analysis

A qualitative content analysis study design was used to identify barriers and supports to ICAP sustainability. Content analysis allows the researcher to organize data, extract meaning from it and draw realistic conclusions to the research question (Bengtsson, 2016). A qualitative content analysis approach, described by Bengtsson, was used to organize and elicit meaning from the transcribed interviews (2016). Content analysis has often been used in aphasia research (Bright et al., 2020; Palmer et al., 2017; Rose et al., 2019; Rose et al., 2018; Wallace et al., 2017). This approach allows for a systematic and structured way to summarize contextual results from qualitative data. The research team who analyzed the data included the second-year graduate student who conducted the interviews, the Principal Investigator (PI) from Idaho State University and the Co-PI from the University of Montana. Both PIs had previous research and clinical experience with the ICAP model. Methodology for coding and analysis followed the recommendations of Bengtsson for qualitative content analysis (2016). A bottom-up approach was used to allow participant responses to drive the extraction process of common themes. Data was collected and analyzed with an inductive approach because established theory on ICAP sustainability has not been previously tested, as this study was the first of its kind (Bengtsson, 2016). Data analysis followed the four stages of content analysis outlined by Bengtsson (2016), including decontextualization, recontextualization, categorization, and compilation.

In stage 1, the **decontextualization stage**, one response to each of the 15 questions was randomly selected and coded together as a group. The three researchers met together through teleconferencing and one researcher shared the screen in order for the team to see and read the same transcript together. Each team member read through the randomly selected data to gain a broad sense of its content. Then each researcher independently determined what broad overarching codes applied to the passage. At this point, codes were not tied to specific meaningful units or utterances. Once the team had discussed each generated code, they came to consensus about the exact wording and which codes were truly present. This broad collaborative coding process took place across three sessions within a two-week period. Once all 15 questions had been broadly coded as a team, one researcher created a codebook from the 33 total codes and added definitions and examples from the interviews. See Appendix B for the finalized codebook. The codebook was sent to the other two researchers to be checked and refined. Once the codebook was finalized, the three researchers independently used the codebook and underwent an open coding process, in which all meaningful information units within the transcribed interviews that related to the research question were coded. One or two transcripts were coded per week over two months, and the research team met weekly or biweekly to come to consensus about any discrepancies in coding (see Interrater Reliability for Coding below). Early in the process, codes were added or removed from the codebook as the team agreed they were not specific enough or overlapped too much with another code (Bengtsson, 2016). This coding process was facilitated and managed with Dedoose, an application for analyzing qualitative data (SocioCultural Research Consultants, 2018).

In stage 2, the **recontextualization stage**, coded data was reread from the original text to make sure all content relating to the research question of ICAP sustainability had been

appropriately marked (or not marked). In other words, the recontextualization stage ensured that important information in relation to the study's aim had been appropriately marked, and all other information, or 'dross' (Burnard, 1991, Burnard, 1995), had been appropriately left unmarked. This process was heavily facilitated by Dedoose in that all applied codes were easily read within the context of the original text (SocioCultural Research Consultants, 2018). Information deemed unimportant to the research question was excluded from further analysis.

In stage 3, the **categorization stage**, meaningful units (excerpts) were condensed and divided into themes and subthemes until a reasonable explanation for the research question was reached. First, each individual code that was applied within the question of 'supports' and 'barriers' (see Appendix A for interview questions) was compiled. Next all other applied codes, regardless of the question it was coded beneath, were collected so long as it contributed to the concept of supports or barriers. All support excerpts, regardless of code, question, or program were gathered into a single document and then analyzed as a team for emergent major themes and subthemes. The process was iterative and dynamic in that as the team progressed through the transcripts the themes were refined. The same process was conducted for all barrier excerpts. Categorization also included making sure all codes that were similar, or homogenous, were applied under the same theme of subtheme (Bengtsson, 2016).

In stage 4, the **compilation stage**, and in alignment with the qualitative content analysis approach, the data was interpreted from a neutral perspective. The three researchers met and discussed the emerging themes and subthemes until a consensus was met. This process was iterative in nature, meaning that the researchers repeatedly examined the themes, determined which ones to group together if they convey similar messages, and which ones to exclude entirely if they either lacked sufficient quantity or quality of responses and/or did not directly

respond to the research question. Further, manifest analysis, a process of staying ‘close’ to the original transcripts by using the participants' own words, was used to present the results so results could remain as close as possible to the original meaning and context (Bengtsson, 2016). To protect programs’ identities, words within the excerpts that revealed the program’s location were marked with an ‘[X]’.

Interrater Reliability for Coding

Three transcripts were used to calculate interrater reliability: E2, N2, and E3 (about 38% of the total transcripts). These transcripts were checked prior to the research team meeting to come to consensus on code application agreement. For example, under the question of ‘supports’, if all three researchers applied the code “staffing” then agreement was 100% (3/3). If two of the three researchers applied the same code that was considered sufficient agreement. For the three checked transcripts, at least two of the three researchers applied the same code to the same excerpt for 51% of the total applied codes. When only one of three researchers applied a code, it was discussed and the team came to consensus on its application. Although initially, agreement appears relatively low, the research team met and discussed 100% of applied codes and came to 100% consensus for all of the codes with disagreements. Thus, the final agreement for all code applications was 100%.

Results

Table 2: Overview of Theme and Subthemes to ICAP/mICAP Sustainability

Supports to Sustainability	Barriers to Sustainability
<ol style="list-style-type: none"> 1. Operationalizing Procedures <ol style="list-style-type: none"> a. Manualizing Program Procedures and Processes b. Training and Onboarding c. Team Connection and Communication d. Space and Resources 2. Intentional Programmatic Improvements 	<ol style="list-style-type: none"> 1. Limitations in Research <ol style="list-style-type: none"> a. Participant Candidacy b. Program Intensity and Dosage Demands c. Efficacy of ICAPs/mICAPs 2. Resource Restrictions <ol style="list-style-type: none"> a. Allocation of Time b. Staff Training

<ul style="list-style-type: none"> a. Stakeholder Commitment and Expectations b. Intentional Recruitment Practices c. Intensity Optimization d. Participant Candidacy and Cohort Characteristics 	<ul style="list-style-type: none"> 3. Program Accessibility <ul style="list-style-type: none"> a. Number of Participants b. Participant Candidacy 4. Programmatic Funding Challenges and Economics of Healthcare <ul style="list-style-type: none"> a. Staffing Models b. Secondary Costs c. Funding Sources
<ul style="list-style-type: none"> 3. Passion and Commitment to the Model <ul style="list-style-type: none"> a. Program Leader b. Theoretical Foundation and Motivation 	

Sustainability Contextual Framework

Following the 4-stage qualitative data coding and analysis for the eight transcripts from the semi-structured interviews with ICAP leaders, a framework emerged in which two broad topics serve as the backbone for how themes and subthemes impact an ICAP’s sustainability. First, the program’s **setting** was a prominent factor that strongly influenced the supports and barriers of programmatic sustainability. For example, a program may be constrained in its available resources, recruitment procedures, staffing and other elements of sustainability depending upon its status as an academic research program, a clinical program, or a medical-based program. The topic of setting also includes funding structures, which vary from nation to nation. For example, one hospital-based European program explained “I think the most challenging barriers are actually the financial situation at the hospital because the length of the program depends on how it's financed from the government. Since it's cost-free for the patients the hospital has to make some money by how the government is paying for inpatients. And at the moment they usually pay for up to two weeks stay, but we have three weeks. The third week is not paid the same amount. Hence, at the moment, we are actually discussing changing the model to maybe add a two plus two weeks program”. Or in a university setting, another explained “we had support of internal funding from the Dean's office.” Setting also influenced a program’s

ability to find and maintain participants for enrollment; “We're integrated into a huge nonprofit hospital organization in northeast [X], so we had a list of 15 people that had already said they were interested. That [recruitment] was really quite easy”. Another program explained “we cannot increase our beds because we don't have more room in our hospital”. A program’s setting also impacted their ability to secure resources; “In [X] universities there are bitter fights for resources and room and personnel, and whatever”.

A second factor embedded within the context of setting is the **staffing model(s)** available and utilized by each program. Staffing models include the use or lack of use of graduate student clinicians, structure, and level of involvement of the administrative staff, and availability of an interprofessional team. For example, one program explains the importance of their administrative staff; “It takes a village approach to completing our ICAP. So that really starts on the administrative end”. Typically, academic-based programs that use student clinicians described the essential support of the students; “We really couldn't do the program without having the graduate students who are placed with us for their practicum every semester”, and “our students are such critical team players within the program as well”. However, a non-academic-based clinical program described the use of graduate students as more of a barrier than a support; “We found we had to drop that [graduate student inclusion] because mentoring the students through the process- there's so much time involved that it actually made the program more expensive than if we just did it ourselves one to one without students”. Hence, staffing models heavily influenced the described sustainability barriers and supports of a program. Other factors, such as program duration, intensity, and funding sources were also found to be dependent to some extent upon the program’s setting and staffing model. In summary, the setting and staffing structure are

an important part of each program's framework and specifically impacts the programs supports and barriers to sustainability.

Contingent upon the clinical setting and staffing model, the following themes and subthemes relating to the overall characteristics of supports and barriers to programmatic sustainability emerged from the analysis. Themes were ranked arbitrarily and were assigned a number solely to increase readability. Due to the nature of semi-structured interviews, not all participants were provided an opportunity to respond to all potential questions, and thus it is impossible to assign valid significance rankings (Bengtsson, 2016). Thus, themes were not attempted to be ranked by either importance or prevalence. Seven core themes emerged from the analysis, three for supports and four for barriers. Each major core theme was further categorized into its own set of subthemes. See Tables 2 and 3 for a list of ranked themes and subthemes for barriers and supports to ICAP/mICAP sustainability. See Appendix C for additional examples of participant excerpts related to each subtheme.

Table 3: Themes and Subthemes and Framework Schema

<u>Structural Framework Factors that Influence Program Sustainability Characteristics</u>			
Setting Context		Associated Staffing Models	
Research or University Setting		Graduate Student Inclusion	
Medical or Hospital Setting		Interprofessional Design	
Other Clinical Setting		Administrative Support	
<u>Characteristics of Sustained ICAPs/mICAPs</u>			
Supports		Barriers	
Themes	Subthemes	Themes	Subthemes
Operationalizing Procedures	Manualizing Program Procedures and Processes	Limitations in Research	Participant Candidacy
	Training and Onboarding		Program Intensity and Dosage Demands
	Team Connection and Communication		Efficacy of ICAPs/mICAPs
	Space and Resources	Allocation of Time	
Intentional Programmatic Improvements	Stakeholder Commitment and Expectations	Resource Restrictions	Staff Training
	Intentional Recruitment Practices	Program Accessibility	Number of Participants

	Intensity Optimization		Participant Candidacy
	Participant Candidacy and Cohort Characteristics		
Passion and Commitment to the Model	Program Leader	Programmatic Funding Challenges and Economics of Healthcare	Staffing Models
	Theoretical Foundation and Motivation		Secondary Costs
			Funding Sources

Supports to ICAP Sustainability

Support Theme 1: Operationalizing Procedures (OP)

Operationalizing procedures was a frequently recurring theme with many of the interviewees commenting on its importance as a support to sustainability. Operationalizing procedures is how a program’s regular tasks and activities were placed into a system to enhance ongoing operations. This theme included comments on operationalization of the recruitment process, daily scheduling during the program, staff training, etc. Participants often described operationalizing as a way to streamline program processes to reduce workload and improve the overall program’s quality. Within this theme, four subthemes emerged and are discussed below.

OP Subtheme 1: Manualizing Program Procedures and Processes

Many participants specifically discussed the importance of manualizing their programs’ regular activities and tasks. This was often described specifically as a “manual”, but also was expressed in terms of a “system”, “orientation packet”, “template”, etc. It was frequently described as a component to ensuring that strong, evidence-based therapeutic interventions were utilized to maintain the program’s treatment fidelity. For example; “I would say, definitely, to the extent possible, manualize the intervention so that you have some clear boundaries around what types of support you're going to provide”. The idea of constructing and using a clear and explicit manual was repeatedly recommended; “We created a lot of templates and how-tos and

instructions and manuals on how to deal with insurers in creating lists with good and bad insurers lists and how to communicate with patients. So basically, an instruction manual for the ward in order to guarantee the functioning of the unit”. Lastly, manualization was commonly discussed as a way to help stabilize and support recruitment processes; “We spent a lot of energy on streamlining the application process and the onboarding process”.

OP Subtheme 2: Training and Onboarding

The second subtheme that emerged was on the importance of explicit operationalization of staff onboarding procedures and staff training to support programmatic sustainability. For example, one program explained that an important element of sustainability for their program was creating “written out” procedures to train new staff members. Another program discussed the importance of set procedures for the purpose of training staff specifically to secure funding and for program efficacy; “If you want to be successful at that and have a sustainable program where you're getting good outcomes and you have people who want to continue to enroll in your program and you can demonstrate the efficacy of your program for funding sources, etcetera, then you need to have a set way that you do things and train people so that everything is happening in a similar way”. Finally, programs that used student clinicians often described the importance of establishing strong training and onboarding procedures for the students. For example, one program described part of their set student clinician training procedures; “We had a whole day of training for our students...We actually have a promotional video that was created our first year that we did the program with our media department. So, we shared the video with them. They're assigned journal articles to review ahead of time and then we have a brief time to reflect on the outcomes of those articles. Also, this year we really wanted them to have some observation of performing aphasia intervention via telepractice, and so they were assigned a

video”.

OP Subtheme 3: Team Connection and Communication

A somewhat less commonly discussed theme is the idea of creating procedures for the team to develop connections and relationships with other staff members and the participants. This subtheme was described frequently enough that it was found to be an important element of operationalizing procedures. For instance, a program explained the value of “communicating at the end of the day, having a quick debrief and saying these are things that seemed like they went really well today...So there's clear communication about what's working and not working, either with a particular participant or between the clinicians etcetera. Also, if there's any health issues, that is really important”. Another program explained the importance of operationalizing procedures for clear communication of staff roles; “That’s why you have your system, and so you trust the process but also communicating very much early on so people know who's going to do what”. Procedures for team connection and communication were often especially important for programs that utilized student clinicians because it helped them regularly debrief with more experienced clinicians. It was also described as an important element for staff training at the beginning of each cohort program; “I think otherwise having really open communication, so making sure that there's a space for clinicians to communicate and debrief with one another and talking about the day or the week or something about the things that worked well and the things that didn't seem to work well. That's really, really important in the first couple weeks of each group especially when you have new people”.

OP Subtheme 4: Space and Resources

The final subtheme to emerge within operationalizing procedures is the importance of having a set space and available resources to engage in ongoing operations of the program.

Specific resources most commonly discussed include the need for rooms and space to hold the program and access to technology. Multiple programs explained the value of building on existing resources when creating the ICAP or mICAP; “The infrastructure that was already in place was that we had a lot of the resources being in a clinic setting in a university already. When it was in-person, having treatment rooms [and] being able to book a room for the semester for group-based treatment [was a support]”. Similarly, a program explained “you usually should start with what you have at the clinic already and then build on that, because then it's usually much easier to implement something new instead of trying to put something totally new over everybody's head”. An additional space consideration was the importance of adequate space with appropriate equipment; “Space considerations are important, so we're about to be moving offices and the office we're looking at is just barely adequate space-wise for an ICAP” and “the really important thing was to have a room where you could lock the door. That was so simple”. Finally, some programs described the importance of technology as a resource of therapy provision; “And of course, probably technology - we do use some technology as well. So those are kind of the things I would say that we couldn't do without”.

Support Theme 2: Intentional Programmatic Improvements (IPI)

An additional prevalent theme was programs' openness to intentional programmatic improvements. Most programs described the essential value of a willingness to intentionally improve their program and make necessary adjustments for sustainability purposes. One program spoke to the overall theme of willingness to make ongoing programmatic improvements; “The more things [program procedures that] are documented as well and tested and then reflected on, and then the things that are working well - keep those. And the ones that are not, write down

what didn't work and why, and be better there so you're not constantly reinventing the wheel”.

Four subthemes emerged from this major theme, discussed in detail below.

IPI Subtheme 1: Stakeholder Commitment and Expectations

An element of implementing programmatic improvements is the importance of understanding and managing stakeholders’ expectations and commitment to a program, and potentially adjusting programmatic elements based upon those expectations. Specific approaches to this included implementing and incorporating feedback from satisfaction surveys that participants and their family completed. Other programs gathered feedback through participant and family interviews and training; “Another thing is really careful interviewing of the participant and their family and interacting with them so that they really understand what the program itself is and what's going to be expected of them and what their goals are, even before you enroll them and consent them...be upfront with the participants when they enroll, the participants and their families about expectations”.

IPI Subtheme 2: Intentional Recruitment Practices

An additional subtheme that emerged was adjusting recruitment procedures (including who to recruit, how to recruit, and how many people to recruit) for the program on an ongoing basis. Some programs described recruitment practices conducted through an interview; “So it was just making sure that we did a proper interview process and had all the medical records”. Others were influenced in who they took to justify the program to insurance companies; “We try to reduce the number of returners in order to give new patients a chance. I'd say right now it's 10% returners and 90% new patients. We had patients that participated up to eight times. We stopped this because we said that there are so many patients who need this sort of program. We cannot afford to spend this on veterans, we need to give new patients a chance. So, people are

eligible for up to two treatment cycles, particularly if they succeed or if they benefited from the first one. So if they achieved measurable improvements, they are eligible for a second cycle - if the insurance is going along, of course”. Interestingly, some programs discussed having to adjust the recruitment process due to a growing demand, and others due to a decreasing demand; “We had very hard times in recruiting patients for a few years...but then we went out and made ourselves more known...now we have many more applications than we can really deal with”, versus “so, initially, there was no problem recruiting. Now it's more and more difficult to get people at the same time. That initial backlog of people that were chomping at the bit for this is not there”. Some programs described supporting recruitment practices through networking; “So, at the beginning though, I believe it [recruitment] was a little slower. Now that there are more people in SIG 2 who know about us, and we've spoken at ASHA and different state brain injury associations, I think word of mouth and working with other clinics in the area has really helped. So just being familiar with people now has made recruitment easier”.

IPI Subtheme 3: Intensity Optimization

Participants often described necessary adjustments to the intensity of their programs. One program explained they did this due to staffing limitations; “The other change is we reduced the amount of time from seven weeks to six weeks in order to serve more patients per year, because we cannot increase our staffing. That's prohibited from a financial point of view and we cannot increase our beds because we don't have more room in our hospital”. Program leaders also cited a need to adjust the participant to clinician ratio to maintain intensity. For example, one program met the demands of intensive treatment by hiring more staff and creating smaller groups. Another program optimized intensity because of participant feedback during an exit interview; “they [the participants] would much rather have 60% of the hours per day at 60% of the cost”.

Others explained they had to adjust the number of participants per clinician “for treatment purposes”.

IPI Subtheme 4: Participant Candidacy and Cohort Characteristics

The importance of recognizing participants’ candidacy for an ICAP or mICAP to improve a program was a commonly discussed subtheme. General candidacy includes where participants were located in relation to a program, their personal draw towards a particular program and/or its location, and their status as a returning or new participant. For example, one program explained that the enrollment of returners who “would like to come back for a second or third time because they see the effect of the program and that increases the waiting lists” supported their ability to sustain the program due to ongoing program demand. Another program determined eligibility for participation in a follow up program based upon “if they achieved measurable improvements”.

Candidacy also included the factors that drew participants to a program. Most interviewees cited program location as an important factor for drawing particular participants to their program. For example, one program explained that “I think having the building where we were located in [X], an urban center where there's many, many hospitals and other medical institutions around or universities. Also, people want to come to [X], so I think that was probably also a draw. People who are retiring, we have some families who are like ‘oh yeah like we'd love to, we're retiring soon, maybe we'll go to [X]’ or “the most profound change that we’ve done now is to implement it in [X] so they don't have to go to [X]”. Some programs explained that the adoption of a telepractice model attracted additional participants; “So there were actually people who haven't been able to join prior due to the relocation issues. Then we said hey we're doing this over telepractice and we'd like to give you an opportunity to participate” and “now with the

Corona times we have a Zoom in the larger extent or other kinds of digital rehab and that's a good opportunity to also meet their next of kin easier so they don't have to go to the hospital”.

Understanding the characteristics of participants who may benefit from participation in an ICAP was also frequently discussed as an important part of ongoing programmatic improvements. Characteristics include participants’ aphasia severity level, presence of comorbidities, and personal endurance. For example, a program discussed aphasia severity, and ways to adapt material to a client with severely impaired receptive abilities; “This year we had somebody that was more on the Wernicke's side with not as much receptive abilities.... we found ways to adapt. She, for example, did not really enjoy the large group. We had to find ways for the students to feel comfortable adapting the material so she could be successful. But there were some days that she preferred just to not participate in that and really just do the individual sessions”. One program described developing a “slight screening about aphasia to see if a person was matching to a severe group or more milder group” to support participant candidacy and cohort organization by severity. Another program explained the importance of adequate endurance for the intensive program; “In general, to get the benefit of this intensive intervention, you're going to need to be able to tolerate these things [intensive treatment regimen]”. Other programs reflected on the characteristics of participant comorbidities; “We had another case in the past of somebody who is apraxic and referred to our program and he shared that he felt he got the same level of satisfaction out of the program that our other folks with aphasia” and “they [cohorts] could also be mixed, it wasn't only aphasia. It was apraxia of speech, sometimes also dysarthria and voice problems, so it was a little bit different depending on the groups that we had”. The importance of creating cohorts that can relate was discussed further. One program reflected that while they initially tried to match participants in each cohorts by severity, they

were surprised at the heterogeneity of severities in a group that could successfully blend together; “However, we learned that's [varying severity level participants] not necessarily the worst thing that can happen because people do actually work really well together, even if they're not at the same level - if it's not too big a difference”. They also reflected on the consequences of the group's “energy” if one person “is really standing out from the rest of the group”.

Participant characteristics influence the ability of the cohorts to form relationships. The value of cohort relationships and ability to progress through the program together was a frequently discussed topic. One program explained the importance of participants “being compassionate and flexible with one another. The group dynamic might be funky in the beginning but being really mindful and intentional about it and that it will improve”. Another explained that a cohort characteristic they frequently heard feedback on from participants was size; “I thought that it could be good to mix individual training with smaller groups and then bigger groups for the social benefits of it, but actually our participants didn't like over six people. Then it was like no we don't like this at all, and I was kind of surprised with that. You really need those small groups. And of course, if you go for dinner or socialize, then you can be a bigger group. But when they do their training they really love those smaller groups”.

Supports Theme 3: Passion and Commitment to the ICAP Model (PC)

An interesting theme that emerged is the importance of passion and commitment of those involved in the program, most notably the program’s leader. The passion of staff and commitment of other stakeholders to the ICAP or mICAP model was frequently discussed as a support throughout the interviews on programmatic sustainability. Staff that are “dedicated”, “passionate”, and “motivated” were very frequently cited as essential to a program. Ancillary and interprofessional staff were also described as an essential, such as nurses, who “if they

[nurses] don't want to do it then the whole program doesn't really work well". Others describe the importance of "passionate staff members - the clinical people who really, really wanted to do this because they really saw a gap in the service and because they like working in the area of aphasia". Another commented "but if they have motivated staff that say we need the program - the effect of it - then it's much more difficult for them [funder/institutional leadership] to stop them [the program] because of, for example, financial discrepancies. So, I think a motivated staff is the most important thing". Some program leaders described their student clinicians as "critical team players" who "really put their heart and soul and are immersed into aphasia intervention". Others describe the importance of leadership beyond the ICAP itself; "We feel very supported by the administration and those higher up with many of the projects that we propose" and "our legal department is very convinced of our work and they support us in court".

PC Subtheme 1: Program Leader

The specific importance of the passion of program leaders for the model was discussed so frequently it was determined to be its own subtheme. Interviewees explained the ICAP leadership role as potentially "intimidating", and the leader needing a "huge passion". One participant had recently transitioned away from the leadership role of the program and explained that even after that transition "I'm always involved in the discussions. I usually also meet each group for a shorter or longer talk about aphasia and stuff like that". A leader also has to be an individual whose "main goal is to help these folks with aphasia". They are also willing to make programmatic improvements and decisions about operationalizing procedures; "I would love to continue to make the program better. For example, as my colleagues and I look at the research, is there something that we're not doing?". Similarly, another explained that strong leadership of a program is "philosophy, but it's also more than that. It's when do we feel we really need to bend

over backwards to make this happen, and when do we feel that maybe this isn't the right time to do it, and we should defer it for a few months?...and if [X] and I hadn't been having that discussion I'm not sure who would have". Program leaders were also at times described as having extensive training and expertise that supported their running of the ICAP or mICAP; "So there's three of us, and we all have gotten specialized training from Aphasia Institute. We've done all sorts of CEUs [continuing education units] and things like that to make sure that we are all trained".

PC Subtheme 2: Theoretical Foundation and Motivation

One program, when asked about advice they would offer to a new program, explained "I think having a strong theoretical foundation for the program and the decisions that you make in the program's design [is] really important". The importance of a strong theoretical foundation for beginning and continuing the program was commonly described in the context of programmatic sustainability. For example, one participant explained the implementation of their ICAP "happened also because of research and the neuroscientific evidence suggesting that these programs should work, and also [because of] in the aphasia realm specifically the success of previous ICAPs". A research-based program explained they "did a fair amount of research, obviously, to get the program up and running and approved by the IRB with their rationale for why they were even running the program", and another program explained that "certainly, there's a definition of an ICAP and what it means, but then there's a lot that can be operationally defined within that and especially when thinking about why it works...I think that's really important is to kind of have some operational definitions around this is what an ICAP is". In summary, having a defined motivation and theoretical foundation for beginning a program was often discussed as vital to sustainability.

Barriers to ICAP Sustainability

Barrier Theme 1: Limitations in Research (LR)

Programs very commonly described how a lack of research-based evidence made it challenging to guide their program with certainty. Most commonly, programs described a specific lack of available evidence for three major subthemes: understanding principal participant candidacy characteristics for ICAP and mICAP participation, the optimal intensity and duration of a program, and a need for more rigorous research on the efficacy of the ICAP model. Each of these subthemes will be discussed in depth below.

LR Subtheme 1: Participant Candidacy

Research desired on participant candidacy includes basic participant demographics and other disorder-specific characteristics such as age, etiology, and severity of the disorder. This information can help individuals create cohesive cohorts and program methodology partially guided by individual participant characteristics. For instance, one program explained “we need many more studies on the different methods and what methods are good together with what kind of profile.” Another program wondered if positive outcomes from program inclusion is “regularly happening with certain people or certain profiles”, indicating a need for additional research evidence on participant candidacy for a program. An interviewee also expressed desire for increased research on the participant candidacy based upon age; “We mainly concentrate on patients aged 50 or a mean age [of] 50 years...I'm not entirely sure if an ICAP is also something that an 80-year-old person would like to have or would benefit from. So that's something we need to find out more”. Participant candidacy based upon etiology was also a commonly desire area for additional research. One program expressed "we need to find out- is an ICAP also applicable for patients suffering from progressive aphasia? Dementias are on the rise and they're

overtaking stroke as the primary cause of acquired deficits. So that's something we need to find out- if aphasia from neurodegenerative disorders is also something where an ICAP is helpful”.

Candidacy also included the participant categorization as either a returning participant or a new participant. One program explained that “we try to reduce the number of returners in order to give new patients a chance...people are eligible for up to two treatment cycles, particularly if they succeed or if they benefited from the first one. So if they achieved measurable improvements, they are eligible for a second cycle”. This speaks to the importance of developing a stronger evidence base for the clinical profiles that will likely benefit from ICAP inclusion and who may need multiple programs for best outcomes. In summary, program leaders expressed that a major barrier to their programs’ sustainability is a lack of research on clinical profiles that benefit from participation in an ICAP, and whether there should be an emphasis on enrolling new participants or returning participants.

LR Subtheme 2: Program Intensity and Dosage Demands

Participants also expressed desires for more research on optimal intensity and dosages for an ICAP. One program reflected on how to balance duration and intensity of a program; “Maybe it [the program] shouldn't be that intense. More like a longer program with a few less hours”. One program wanted to understand the effects “of repeating treatment programs” versus participation in a single ICAP or mICAP. Another program wished for research “that would give us a little bit more information about intensity and timing - how much”. Similar to that, one program described participants who felt they benefited from the program, but thought it was insufficient; “What happened that first year is that really a lot of people were like, so what's next? Like this was great, but I’m not ready to be done”. This indicated a need to find optimal intensity and duration for a program from the participant's perspective. Yet another program

expressed that “we need to know what would be the ideal treatment time because I know many of the ICAP definitions say about six weeks, four weeks, three weeks. And I think we need more research on that timeline”. Finally, one program leader, reflecting on necessary duration and dosage for financial and participant outcome purposes, questioned “Is there a law of diminishing returns? Is 300 hours too many hours, do we really need all 300? I think maybe we do, but we don't know. So, I think understanding that and then what are the things that we actually need? What gives us the most bang for our buck in the intensive program?”.

LR Subtheme 3: Efficacy of ICAPs

Lastly, program leaders also expressed a desire for more research on ICAP efficacy. For example, one program spoke to the complexity of ICAP research while expressing a desire for more research; “How do we test the components of the program? Because none of it’s happening in a little silo. I really believe it's the combination of all of it, but I think it's really hard to answer that with a research study...So I’m curious about if we could get better at testing what components we don't necessarily need or don't need as much, because then that would help us understand. Boiling it down to like the very least that we need would still give us the same benefit - trimming any fat...These are the key things that we definitely need”. Another program wanted research to ensure that ICAPs are effective regardless of who is running the program, not because “one clinician is really awesome”. One program spoke directly to the need for more robust research in order to advocate the program to potential funders; “Everyone treating aphasia knows that it works, but in terms of evidence-based medicine and cost savings, I believe there's still a lack of randomized controlled trials...I believe in order to convince the insurers that this is worthwhile it really needs to be shown that the effects we're seeing are above chance”. A

different program expressed a similar need; “We would need larger trials with a heterogeneous participant sample with manualized treatment to some extent and testing the different models”.

Barrier Theme 2: Resource Restrictions (RR)

Limited resources were often cited as a barrier to ongoing program management. Resources include the physical resources of space and materials, as well as qualified staff and time availability. Each of these are discussed as a subtheme of resource restrictions below. Restrictions of these resources were due to a wide array of reasons and were very frequently contextualized based upon a program’s specific setting (e.g., country with its individual healthcare economics and societal characteristics, as well as medical, academic or clinical setting status).

RR Subtheme 1: Allocation of Time

The interviewed program leaders often described the large amount of time required to run a program and sometimes discussed where and how to allocate time to specific program tasks. Time was often allocated depending upon the specific role of the individual and if the program was in its infancy or was more mature. Program leaders cited that there were very large time demands early in the program’s development, and that the time demands would gradually subside somewhat. For example, one program leader explained large time demands were required from them because they were “involved in everything”. They explained the tasks required of them early in the program included “recruitment, screening, meeting new families, learning about them, reviewing their medical records, enrolling them, consenting them, assessing them”. Similarly, another program explained that “when taking on the project [program] there was just a lot I had to do and there's still a lot I have to do”. Another explained that “we used a lot of time to, for example, develop a menu where we described all the steps so that new people

would understand what is done in the testing, how to score the testing, how the program works”.

If a program is unable or unwilling to allocate substantial amounts of time to operationalizing procedures early in the program's development, they may face long-term sustainability issues.

Other time allocation barriers included interprofessional inclusion, caregiver inclusion and participant feedback and perspectives. The programs that had interprofessional designs would describe barriers in time allocation between the different disciplines. For instance, one program explained “we had a small conflict with the physiotherapist because they wanted the time”. One program also explained that while they felt it was a “blind spot”, they had trouble providing education to communication partners due to time constraints; “We spend lots of time educating the patients, but they are only half of the communication chain. So it's so valuable to also educate the receivers of aphasic communication, then to educate senders for aphasic recipients”. Finally, interviewees described changes to time allocation within the program’s duration due to participant feedback; “Then we have had groups that wanted to have three hours or four hours during the day. And we've also changed a bit the afternoon and weekend for entertainment programs according to who the people are, what they would like to do”. Programs, in order to remain sustainable, may need to consider how treatment time is allocated dependent upon participants’ needs and preferences. In summary, poor time allocation may lead to poor program sustainability.

RR Subtheme 2: Staff Training

Securing competent staffing was also cited as a barrier to ICAP sustainability; “The barriers for everybody is just cost - so money, cost of staff, and then training”. Challenges to training might be that the professionals are not specifically trained in aphasia intervention, or not trained in providing intensive treatment. One program explained a lack of sufficient training to

be a barrier to the incorporation of interprofessional services into the program; “Usually we have, in the rehab team, the neurologists, the SLP, the physiotherapist and also what you call an occupational therapist. But it didn't work that well with the [X] occupational therapists. I think it was because they are so trained in not doing intensive rehab...So the core team was actually physiotherapists and speech-language pathologists. I also wanted to have a psychologist as well...They [participants] wanted rehab, so we tried to find neuropsychologists that had more training doing rehab. We didn't find any”. Similarly, another program leader explained that “we see a lot of counseling needs that folks are not being served because either the counselor or the psychologist doesn't really know about aphasia so they can't serve them”. A Europe-based program attempted to incorporate more ancillary staff support but found training to be a limitation to their inclusion as well; “That was too hard for them [hostesses] to grasp the speech training because it's a lot of things that you have to think about when you do training that is more language cognitive training”. Another program explained that training and experience with the ICAP model was essential to increase clinical buy-in and competency; “When I got the opportunity to do the intensive treatment and I compared it with the other forms of treatment that I had been given in the past, and it was like this is superior...So I think that's an important thing to do, just to introduce the form to SLPs so they know. Because I can also feel that sometimes when I talk about it, when the SLPs haven't been doing it in real life, they don't really understand what it's all about. So they really need to do it before they can feel how it is to do that kind of treatment”.

Connected to the previously discussed Allocation of Time subtheme, a program explained that staff training required a significant amount of time because “a therapist running an ICAP program needs to be more specialized in aphasia and things like that. It's hard to find really

experienced clinicians that are very seasoned”. Another program leader, when asked if they felt they could leave the program, had reservations because of the training requirements to replace her role; “I actually love my job, so I don't really ever want to leave, but if I did I don't think it would be right ethically. They [new leadership] would require a lot of training and that's because it's so specialized”. Similarly, when some programs were asked to describe their student clinician training process, they described the large amounts of time dedicated to training; “At the beginning of the semester they [students] undergo six hours of orientation. One day is three hours just of orienting them to how the program structure is, how the research works. Then the other three hours we typically orient them to all the clients that they're going to see and how their clinical presentation is what they can expect in treatment... We have the six hours of orientation and then they actually observe about the first one to two weeks of treatment”. Finally, one program described student inclusion as a barrier to program implementation due to the large amounts of time required to train them; “It was more labor on the part of the clinicians to supervise the students, mentor the students, evaluate the students, all while making sure that the clients are getting what they paid for”.

Barrier Theme 3: Program Accessibility

Throughout the interviews, program leaders discussed barriers to participants' ability to access their programs. This included barriers such as program-mandated participant caps, participant characteristics that limit program eligibility, and financial stipulations to participate in a program that include both direct and secondary costs. Each of these are discussed in the following sections as a subtheme to program accessibility. Barriers to program accessibility can hinder the ability of individuals with aphasia to find, participate, and benefit from the ICAP or mICAP model and can subsequently negatively affect long-term sustainability of these programs.

PA Subtheme 1: Number of Participants

Program leaders explained, for a wide array of reasons, placing caps on the number of participants eligible to enroll in a single program iteration. Participant caps were often discussed in close relation to the resource barrier subtheme of Allocation of Time. For example, one program explained; “The first changes we did were to get more therapists and smaller groups so the workload wasn't too high because it's so intensive”. Programs often found they had to limit the number of participants in a program due to the treatment and staffing demands of intensive programs. For example, “Now we're at a point where we're up to like seven or eight people enrolled per semester and that's kind of our cap. We really just can't go above eight for treatment purposes”. Another explains they have a “quota” of “between four to eight people most”. Worth noting, participant caps can help a program by reducing recruitment demands; “Really, recruiting for us at our end was a lot smaller. We're not taking as many people as some of the programs, but for us it really hasn't been that difficult”. However, caps can also be contrived as a hindrance to sustainability as it impairs the ability of persons with aphasia to access in ICAP or mICAP.

PA Subtheme 2: Participant Candidacy

As discussed under the barrier theme of Limitations in Research, program leaders expressed a strong desire for more research on program inclusion candidacy for a program. Thus, it is not surprising that a barrier to program accessibility is challenges of participant candidacy. Often programs have to make difficult decisions about who to include and exclude in their programs based upon limited evidence. Within this subtheme to Program Accessibility barriers, particular participant candidacy characteristics are described directly as a barrier to programmatic sustainability and maintenance. For example, one program explained that the diversity of profiles interested in ICAP participation makes creating a cohesive cohort

challenging; “Another barrier to our program implementation with this type of ICAP is that the population is fairly diverse, so catering the program and the treatment to the needs of a variety of clients - some who have you know moderate to severe aphasia and others who are fluent with no language deficits and have severe deficits in memory or executive functioning. Finding a way to basically integrate all of those needs into one treatment can be difficult because it's such a specialized group”. Also described under candidacy is the idea of ensuring enrollment of participants with adequate “stamina” to be able to ‘handle’ the intensive treatment necessary for ICAP completion. For example, one program described a participant as a “great candidate for an ICAP, but it's just too tiring for him” because he is in a wheelchair and has continence issues that “we just are not equipped to deal with unless he brings an aid and there's no funding for an aid with him”. Another program illustrated the need for participants who “are exceptionally motivated” and that “the people who agreed to do this program are a self-selecting group...they also have the will and the want to do it...Being interested in getting things wrong all day long and having things be hard and being challenged for six hours a day, four days a week for 12 weeks. That's a special person, and a special group [cohort] of them, and doing in front of others”. Candidacy based on aphasia severity was also discussed as a challenge, with a need to adjust the assessment process to meet the demands of participants with both severe and mild aphasia; “We had too long of an assessment. We just realized it was burning for some of our folks with aphasia”.

Barrier Theme 4: Programmatic Funding Challenges and Economics of Healthcare (PFC)

Programs vehemently cited financial barriers to be the most substantial barrier to program sustainability. Program leaders frequently described challenges to funding their programs in relation to healthcare economics, and expressed desires for more evidence on and changes in

healthcare funding. One program succinctly spoke to the importance of this theme; “I would really benefit from, at this point, seeing research on financial sustainability and how that affects funding, budgeting for ICAPs, where the money is going and how they deal with changes in the economy even, in the economics of healthcare”. Another program explained that they faced issues in increasing the program’s availability due to challenges in funding the program; “The very biggest [barrier] is financial. I don't want it to become a country club for rich people with aphasia, but in some respects there's a certain socioeconomic class that can access our program where others can't. The longer-term goal would be to establish enough data that we can pitch it to the public health system to fight. But certainly, money is the biggest one [barrier] absolutely”.

PFC Subtheme 1: Staffing Models

A program’s specific staffing model was highly driven by setting, and both staffing model and setting set the stage for specific barriers and supports. However, staffing models were so often expressed as a barrier within the context of funding challenges, it was determined to be its own subtheme. The financial challenges of securing qualified staffing and the ability to find funding for ongoing training of staff was often described as a challenge to ICAP sustainability. For example, one hospital program saw a need “to hire a mental health therapist that's integrated into the ICAP program that can help with the family members”, and while eventually able to secure some funding for it, did not get it as readily as hoped. Another academic-based program explained, because of how ICAPs are commonly funded, that it was a challenge to find staff who “weren't concerned about the salary...when you have somebody who is okay with a cut in pay because it's likely going to be cheap. It's likely going to be less pay than they could get as an SLP working in regular practice”.

PFC Subtheme 2: Secondary Costs

Secondary costs include any costs not directly related to the program itself, and while this subtheme has similarities to the major theme of Program Accessibility, it specifically addresses financial costs associated with ICAP or mICAP accessibility. This may include travel costs to and from the program, housing, daily transportation, and food costs during the program. One program explained a barrier to implementing “follow-up” after a program for “patients where we had seen great success” was due to participant’s inability to return to the program. Similarly, another program leader stated a primary barrier to ICAP implementation “was the economics - a lot of people can't afford to go to [X] to have that kind of treatment” or “I'd love to have more integration of the relatives and caregivers. But this is a bit difficult because people come from all over [X] and they cannot be there for six weeks” and “another big challenge is the geographic location of patients. Because this is such a special group of patients, they often are in a location that's not necessarily easy to find a central location for treatment...For those who couldn't relocate for financial or logistical reasons, they just simply couldn't get the treatment”. Another explained “people, initially for the program, had to move to [X]. So moving to [X], there's a cost associated with that. They didn't pay for the program. They could be in the program as long as they liked, but they had to pay for an apartment or an Airbnb or whatever”.

PFC Subtheme 3: Funding Sources

An additional very setting-dependent (country location, clinical, medical, academic setting, etc.) subtheme is funding sources. One commonality in describing barriers among all programs, regardless of their funding source(s) (e.g. government or other institutional grants, out-of-pocket pay, private insurance, government funded healthcare, etc.) was the lack of buy-in of funders and policy makers. One university-based program leader illustrated this well, explaining “one of the biggest barriers for continuing a program like this and making it have

some longevity is funding. That's the first main thing. We use a combination of government or federal grants, in addition to internal departmental funding, to basically keep the program going, though we are now exploring more of a paid program model for that reason". Often the barrier of funding sources was discussed in close context to the need for more research. For instance, one program explained "if we really think this is effective we should probably get it to be understood by Medicare and Medicaid. We want it to be reimbursed, etcetera. It should be a right to people with aphasia or right for people with cognitive impairment after TBI [traumatic brain injury]". Another program similarly explained the barrier of funding sources; "And that's also the reason why there are not more centers like ours because it's expensive. It's not something you make a benefit off of as a provider. You would have a hard time convincing the insurances that they are going to pay for this. And that's why nobody is founding new centers". The importance of filling gaps in the evidence-base to convince funding sources was also described; "Those are the questions that, eventually, if we're trying to bill for a service like this or have a code for a service, that's what insurance companies want to know. So it just makes you think what could happen years from now if we had really good evidence for this". A university program explained that "it's complicated to get research and grant NIH [National Institutes of Health] funding for something like this. It's also not easily reimbursed by insurance companies...A huge part of the success of the program is that we were funded by the Dean and their office. They have foundation money, etcetera, that was able to support this new unique novel exploit". A final program spoke to the value of consistent data from research to convince funders; "I wish there were some standard set of outcome measures that we could use and share so that we could all have this data that says to the paying agencies and government and insurers, this is effective, please fund it".

Discussion

This is the first study to investigate the sustainability of Intensive Comprehensive Aphasia Programs (ICAPs) and modified Intensive Comprehensive Aphasia Programs (mICAPs) from the perspective of key leaders within a program. The programs that were interviewed in this investigation spoke to both the characteristics of barriers and supports they have encountered in sustaining their programs. There is a need for sustainable rehabilitation programs, such as ICAPs, to meet the rehabilitation needs of persons with aphasia. Although sustainability can be a complex construct, ICAPs need to be sustainable if they are going to become a more mainstream mode of rehabilitation, a need recognized early in the ICAP model's establishment (Hula et al., 2013). This qualitative study sought to understand the characteristics of sustained ICAPs. Here the resulting themes and subthemes of barriers and supports to ICAP sustainability are discussed. First, some of the more complex findings of this study are discussed, and potential solutions participants discussed to the identified barriers are presented. Second, and as appropriate, the results are related to the existing ICAP literature

Complex Findings and Potential Solutions

Most programs cited the gap in the available care to persons with aphasia as the driving factor for creating their program; "You can only serve so many people with an ICAP, but there are thousands of patients with aphasia each year". Most programs also described needing to implement program participant caps (see barrier subtheme Number of Participants under major theme of Program Accessibility). This can be considered a barrier to the ICAP model's sustainability because it hinders individuals' ability to access a program. However, participant caps are more nuanced than a barrier-only categorization. The caps were implemented frequently because of limited resources, such as time, staffing and space limitations. Thus, these participant

caps were often described as a solution to resource barriers, ultimately framing them as a support in the ability to provide intensive treatment that remains efficacious. In other words, caps could potentially help sustain a program because they allow programs to apply the intensive treatment model, albeit to fewer persons with aphasia. These participant caps were also described as a benefit to recruitment demands, as fewer participants enrolled in a program equated to less time and resources dedicated to recruitment procedures. However, in order to become a more common rehabilitation model, ICAPs need to be a viable option and accessible to the ‘masses’ of individuals with aphasia. Therefore, program participant caps limit the accessibility of programs and may potentially hinder the ability of ICAPs to become a more mainstream mode of aphasia rehabilitation. In summary, participant caps are a complex program facet that have the potential to both support and hinder ICAP sustainability.

There is value in briefly discussing the solutions programs offered to the barriers they have encountered because it demonstrates that ICAPs can overcome at least some of the barriers discussed within this project. Although not the focus of this investigation, a few strategies to overcome barriers will be considered in relation to the emergent themes and subthemes on program sustainability. First, programs very commonly cited a need for streamlining and operationalizing procedures related to the ICAP model. Programs cited huge time requirements to running a program, especially in its initial stages, and operationalizing procedures through explicit manuals was often cited as a potential mitigating factor to these large time demands. For sustainability purposes, programs need to develop procedures to reduce time demands and to ensure that intervention remains rooted in strong evidence-based practices. Some interviewees also offered advice on how to help reduce the time demands not only by streamlining procedures, but also by skillful delegation of program tasks; “Delegating with an intensive program I think is

really important and having a way to streamline the tasks that need to be completed”. Delegation of tasks (to student clinicians in this particular program) and operationalizing procedures (a major support theme) may specifically help overcome the time demand barriers discussed so commonly.

Cost was an unsurprising and very frequently cited barrier. While costs were in large degree dependent upon the program's setting and specific traits, all programs cited a need for sustainable funding (e.g. “One of the biggest barriers for continuing a program like this and making it have some longevity is funding”). Some programs have found ways to reduce program costs. For example, one program explained the use of student clinicians and newly graduated clinicians to ease costs; “It was beneficial that I was an SLP with CCCs so that I could supervise. I could supervise clinical fellows to run the program, that’s a lot less expensive than a research SLP with CCCs”. Another program discussed a way to secure sustainable funding is to increase buy-in from funding stakeholders on the efficacy of the ICAP model and to convince them of the ICAP’s potential long-term cost savings; “I created an additional slide [in a presentation to insurers] where we calculated the costs-benefit ratio of our program. How much does one unit of SLT therapy cost in comparison to a traditional rehab unit where patients are also three weeks, but only receive one to two units of 30 minutes SLT each week. And suddenly we were only half as expensive as the others, and that's when they [the insurers] woke up. And when we told them that basically doing once or twice SLT a week basically achieves nothing, so they are paying twice as much for zero results. That's when they woke up and changed their minds. So my advice to ICAP providers would be to do a cost-benefit relation calculation and show the insurers that they get something for their money...it provides benefits if the money is sent to or is given to

ICAPs”. Cost as a barrier to sustainability, as shown in these examples, may be reduced by incorporating student clinicians and increasing buy-in from funding sources.

Relation to the Current ICAP Research

Some of the barriers and supports identified in this investigation warrant discussion in relation to the current ICAP research. Although this is the first and only study currently on ICAP sustainability, this study mostly agreed with the previous findings in ICAP research. Four specific areas of ICAP research findings are discussed in relation to this sustainability investigation, including cohort relationships, interprofessional services, inclusion of student clinicians, and the specific limitations of current ICAP research.

Individuals with aphasia and their families have cited desires for many of the elements ICAPs are well equipped to deliver, such as the desire for additional aphasia education, and more social communication practice and participation (Howe et al., 2012; Worrall et al., 2011). Participants have also cited a desire for increased opportunities to connect with one another within the program (Kincheloe et al., 2022), or in other words develop strong cohort connections. It is important for those who create and manage ICAPs to ensure they meet these needs through sustainable programs. One way programs inherently meet the need for participant connections is through the cohort design and group therapy component of the program. ICAPs have been found to help support the development of deeper relationships between persons with aphasia and their families (Babbitt et al., 2013; Babbitt et al., 2021; Kincheloe et al., 2022; Off et al., 2019). In this sustainability investigation, program leaders often spoke of an intentionally designed cohort being a support to their program and participants' positive opinion of the program. The cohort design is an essential and unique element of the ICAP model, and may specifically help support sustainability because participants feel they can have more opportunities for meaningful social

communication and form relationships with people with similar aphasia experiences as themselves. This study, under the support theme of cohort characteristics, found that interviewees explained that oftentimes participants cited the importance of groups that blend in order to build stronger cohort relationships. In summary, programs need to make sure they capitalize on the ability of ICAPs to foster relationship building, as it is beneficial for the patient, and can support ongoing sustainability.

Interprofessional service inclusion in an ICAP is an additional conflicting theme worth discussing within the context of prior ICAP research. A few studies on ICAPs have reported the outcomes of an interprofessional program design (Hoover et al., 2017; Kincheloe et al., 2022; Nicholas et al., 2021; Off et al., 2019). These studies have shown that interprofessional services can effectively be provided within an ICAP with positive outcomes for both the participants with aphasia and their caregiver(s). However, this project identified that interprofessional services could be a potential barrier to ICAP sustainability because of time constraints and the challenges of training interdisciplinary professionals in both general aphasia rehabilitation and in the intensive ICAP model (see barrier subthemes Allocation of Time & Staff Training). However, important to note, this was not a uniform finding across included programs, and as previously reviewed in the framework discussion, may be a setting and program specific barrier to sustainability. Programs will need to carefully consider how to implement interdisciplinary services in their program to ensure both positive outcomes for participants and ongoing sustainability of their program.

The inclusion of student clinicians as an integral component to the ICAP model was a point of conflict between findings in previous research and some of the findings from this investigation. In the current literature, the use of student clinicians has been cited to offset costs

of running the program (Griffin-Musick et al., 2020; Griffin-Musick et al., 2021). While some of the program interviewees agreed with this notion, at least one program found the opposite to be true, with graduate students' inclusion increasing program costs because of the heavy supervision and training requirements to support student inclusion. This is also likely a setting specific barrier. Programs that have the infrastructure already in place for graduate student inclusion, such as a teaching hospital or medical center and an academic research based ICAP, may be more likely to find student clinician inclusion to be a support rather than a hindrance. The subtheme of Training and Onboarding within the major theme of Operationalizing Procedures may also apply here as having clear and operationalized training procedures may support student inclusion by reducing the long-term time demands of student supervision and training.

In comparison to the findings of this study and specifically the theme of Limitations in Research, other studies have also described the need for additional evidence on ICAP intensity, specifically dosage, number of items targeted per session and the effect of this intensity on the components of an ICAP (Auclair-Ouellet et al., 2021). Interviewees in this qualitative study cited needs for additional research on intensity and duration of the ICAP model. Further, some participants also desired a better understanding of who will benefit from ICAP participation (e.g., severity level, age, subtypes, etc.) (see the subtheme Participant Candidacy within the major theme of Limitations in Research). Recent research on ICAPs have cited a similar need for understanding participant candidacy (Auclair-Ouellet et al., 2021) Currently, age has been shown to weakly predict responsiveness to treatment (Babbitt et al., 2015), but more robust and nuanced investigations are needed on this topic of program candidacy. Lastly, clinicians' desire for more research specifically on ICAP efficacy and feasibility aligned both in this sustainability study

and in the current ICAP literature (see the subtheme Efficacy of ICAPs/mICAPs within the major theme of Limitations of Research). A study by Trebilcock and colleagues (2016) found that clinicians wanted more feasibility studies that showed the benefits of intensive and comprehensive treatments for aphasia. A recent study by Monnelly and colleagues (2021) also systematically described areas that need additional research on the ICAP model, including more research for the rationale of core components of the ICAP model (Rose et al., 2013). Additionally, within the research agenda described by Hula and colleagues (2013), there are only two published phase II efficacy studies and a single Phase III effectiveness clinical trial that has not yet published. This further indicates the need for more investigations on ICAP model in order to support sustainability.

Future Directions

It is recommended that a member check be conducted to enforce validation of this study's findings (Bengtsson, 2016). This was not completed before the presentation of this project due to resource and time constraints. Member checks involve presenting the results to the original eight informants to ensure both parties (researchers and informants) are in alignment and that participant responses were understood and interpreted correctly (Bengtsson, 2016).

An interesting component of this project came from one specific question about what research the ICAP leaders wish they had on ICAPs (see Appendix A for the interview script). All eight participants were asked this question. The program leaders expressed a need for more research on various aspects of ICAPs, including investigations on optimal intensity and duration, participant candidate characteristics and more evidence into the efficacy of the ICAP and mICAP model (see the barrier theme of Limitations in Research). Due to detailed and specific feedback that was given in response to this question, further discussion is warranted beyond the scope of

this project. Thus, it is recommended that future investigations seek to understand the specific areas of research that clinicians involved in an ICAP believe is necessary for sustainability of their programs. Further research into the specific evidence-base gaps on ICAPs will be beneficial to directing efficient research resources and support the general sustainability of ICAPs.

Another question that garnered interesting responses came from the specific question on the gap or need that prompted their program's implementation. While this was briefly discussed above, it may be an interesting area to explore in depth to better understand what specific demands lead to the implementation of an ICAP or mICAP. Program leaders were also asked what advice they would offer to a new or emerging ICAP and what they wished they had done differently when they had begun their program. The participants' responses to this question may provide further insight on how to overcome some of the barriers described within this paper, and foster program sustainability.

Lastly, for next steps specifically regarding ICAP sustainability, it is recommended that this study be a start to a series of ongoing investigations on supports and barriers of ICAP sustainability. The sustainability characteristics (both supports and barriers) described here are likely to evolve over time as programs mature, and it is important for the construct of sustainability to gather information on the changes and dynamic processes that contribute to the barriers and supports that programs experience over time (Power et al., 2020). It may also be beneficial for future studies to compare the characteristics of programs that have been sustained, or have lasted, to programs that have had to be discontinued.

Limitations

All participants were recruited through the participant base from the Rose and colleagues (2021) quantitative survey respondents. Within that study not all potential participants (e.g.,

individuals who were sent a link to the survey) responded to the survey. Thus, the form of purposive sampling adopted for this investigation may not represent the full range of perspectives on ICAP sustainability, as programs that did not participate in the Rose and colleagues 2021 quantitative study were not provided an opportunity to participate in this sustainability study (Oppong, 2013). Similarly, qualitative studies, because of their time intensive nature of analysis, typically have few participants, as was the case of this study. A smaller sample size may limit the ability to generalize the findings (Oppong, 2013). Additionally, an inherent potential limitation of qualitative research is the risk of bias. The research team have all had prior experience with the ICAP model and are active members of the ICAP community, which introduces potential for bias in analysis and in the interpretation of results. However, the team took measures to prevent bias, such as explicitly tracking the decision-making process throughout analysis (Noble & Smith, 2015). Finally, all interviews were conducted in English, the native language of the interviewers. Although all participants spoke English well, it was not the primary language of three of the interviewees, leaving a chance for cultural and linguistic misinterpretations (Welch & Piekkari, 2006). However, this was not considered to be the case, and the plans for a member check will help reduce any limitation to the study this may potentially have caused.

Conclusion

ICAPs serve many of the needs of individuals with aphasia. These programs fill a gap in aphasia treatment by providing more intensive and comprehensive treatment than traditional rehabilitation options. ICAPs also treat cohorts of individuals with aphasia, which can support participants psychosocial wellbeing through the formation of cohort relationships. The cohort design also provides a context for more naturalistic language practice. These programs have been

shown to consistently benefit individuals with aphasia, however they can be difficult to implement and sustain due to their large resource demands.

Sustainability is a consistent challenge to healthcare programs and needs to be investigated to ensure the best use of healthcare resources (Shelton et al., 2018). This qualitative investigation on the characteristics of sustainability for Intensive Comprehensive Aphasia Programs presented themes and subthemes of supports and barriers ICAP leaders have experienced in running their programs. The study also identified two key factors, setting and staffing models, that serve as a framework for specific characteristics of the supports and barriers. The seven major themes emerged from analysis, with three specifically labeled as a support to sustainability and four as a barrier to sustainability. The support themes include; Operationalizing Procedures, Intentional Programmatic Improvements, and Passion and Commitment to the Model. The four specific barrier themes to sustainability included; Limitations in Research, Resource Restrictions, Program Accessibility, and Programmatic Funding Challenges and Economics of Healthcare. These themes provide insight into the barriers programs are likely to encounter, and helps programs identify key supports to implementation and sustainability. Current and future programs should thoughtfully consider programmatic sustainability so that the ICAP model can increasingly be provided to persons with aphasia.

In conclusion, a quote from one of the programs interviewed expresses the overall importance of this investigation; “Aphasia is a devastating disability because it really destroys what it means to be human...the patients can't speak for themselves, obviously, so they don't have a lobby and we need to be their lobby. So, get the word out that the aphasia therapy is working and you need to have the effort and you really have - the big “I” - the intensive, that's it. And if it has to be an ICAP, then it needs to be an ICAP.” ICAPs and mICAPs are an exciting

and relatively new mode of aphasia rehabilitation. This study addressed the barriers and supports to ensuring Intensive Comprehensive Aphasia Programs are not only effective, but also sustainable so that eventually, more individuals with aphasia may access the care most appropriate and beneficial for them.

References

- Albert, M. L., Sparks, R. W., & Helm, N. A. (1973). Melodic intonation therapy for aphasia. *Archives of Neurology*, 29(2), 130–131. <https://doi.org/10.1001/archneur.1973.00490260074018>
- Allen, L., Mehta, S., McClure, J. A., & Teasell, R. (2012). Therapeutic interventions for aphasia initiated more than six months post stroke: A review of the evidence. *Topics in Stroke Rehabilitation*, 19(6), 523–535. <https://doi.org/10.1310/tsr1906-523>
- Auclair-Ouellet, N., Tittley L., & Root, K. (2021). Effect of an intensive comprehensive aphasia program on language and communication in chronic aphasia. *Aphasiology*, <https://doi.org/10.1080/02687038.2021.1959016>
- Babbitt, E. M., Worrall, L. E., & Cherney, L. R. (2013). Clinician perspectives of an intensive comprehensive aphasia program. *Topics in Stroke Rehabilitation*, 20(5), 398–408. <https://doi.org/10.1310/tsr2005-398>
- Babbitt, E. M., Worrall, L., & Cherney, L. R. (2015). Factors contributing to improvements after an intensive comprehensive aphasia program. *International Journal of Stroke*, 10(3), 53. <https://doi.org/10.1111/ij.s.12585>
- Babbitt, E. M., Worrall, L., & Cherney, L. R. (2015). Structure, processes, and retrospective outcomes from an intensive comprehensive aphasia program. *American Journal of Speech-Language Pathology*, 24(4), S854–S863. https://doi.org/10.1044/2015_AJSLP-14-0164
- Babbitt, E. M., Worrall, L., & Cherney, L. R. (2021). 'It's like a lifeboat': Stakeholder perspectives of an intensive comprehensive aphasia program (ICAP)'. *Aphasiology*, 36(3), 268–290. <https://doi.org/10.1080/02687038.2021.1873905>
- Baliki, M. N., Babbitt, E. M., Cherney, L. R., & Harvey, R. L. (2018). Brain network topology influences response to intensive comprehensive aphasia treatment. *NeuroRehabilitation*, 43(1), 63–76. <https://doi.org/10.3233/nre-182428>
- Beeson, P. M., Hirsch, F. M., & Rewega, M. A. (2002). Successful single-word writing treatment: Experimental analyses of four cases. *Aphasiology*, 16(4–6), 473–491. <https://doi.org/10.1080/02687030244000167>
- Beeson, P. M. (1999). Treating acquired writing impairment: Strengthening graphemic representations. *Aphasiology*, 13(9–11), 767–785. <https://doi.org/10.1080/026870399401867>
- Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open*, 2(8–14), 8–14. <https://doi.org/10.1016/j.npls.2016.01.001>

- Boyer, N., Jordan, N., & Cherney, L. R. (2020). Implementation cost analysis of an intensive comprehensive aphasia program. *Archives of Physical Medicine and Rehabilitation*. <https://doi.org/10.1016/j.apmr.2020.09.398>
- Brady, M. C., Kelly, H., Godwin, J., Enderby, P., & Campbell, P. (2016). Speech and language therapy for aphasia following stroke. *Cochrane Database of Systematic Reviews*, 47(10). <https://doi.org/10.1002/14651858.cd000425.pub4>
- Bright, F. A. S., McCann, C. M., & Kayes, N. M. (2020). Recalibrating hope: A longitudinal study of the experiences of people with aphasia after stroke. *Scandinavian Journal of Caring Sciences*, 34(2), 428–435. <https://doi.org/10.1111/scs.12745>
- Centers for Disease Control and Prevention. (2019). Stroke Facts. Retrieved from <https://www.cdc.gov/stroke/facts.htm>
- Chang, H. F., Power, E., O'Halloran, R., & Foster, A. (2018). Stroke communication partner training: A national survey of 122 clinicians on current practice patterns and perceived implementation barriers and facilitators. *International Journal of Language & Communication Disorders*, 53(6), 1094–1109. <https://doi.org/10.1111/1460-6984.12421>
- Cherney, L. R., Merbitz, C., & Grip, J. C. (1986). Efficacy of oral reading in aphasia treatment outcome. *Rehabilitation Literature*, 47(5–6), 112–118.
- Cherney, L. R. (2021). *The Intensive Comprehensive Aphasia Program (ICAP)*. Clinicaltrials.gov Identifier NCT03514186). Retrieved from <https://clinicaltrials.gov/ct2/show/NCT03514186>
- Code, C., & Petheram, B. (2011). Delivering for aphasia. *International Journal of Speech-Language Pathology*, 13(1), 3–10. <https://doi.org/10.3109/17549507.2010.520090>
- Engel-Yeger, B., Tse, T., Josman, N., Baum, C., & Carey, L. M. (2018). Scoping review: The trajectory of recovery of participation outcomes following stroke. *Behavioural Neurology*. <https://doi.org/10.1155/2018/5472018>
- Escher, A. A., Amlani, A. M., Viani, A. M., & Berger, S. (2018). Occupational therapy in an intensive comprehensive aphasia program: Performance and satisfaction outcomes. *American Journal of Occupational Therapy*, 72(3), 1–7. <https://doi.org/10.5014/ajot.2018.026187>
- Cicerone, K. D., Langenbahn, D. M., Braden, C., Malec, J. F., Kalmar, K., Fraas, M., Felicetti, T., Laatsch, L., Harley, J. P., Bergquist, T., Azulay, J., Cantor, J., & Ashman, T. (2011). Evidence-based cognitive rehabilitation: Updated review of the literature from 2003 through 2008. *Archives of Physical Medicine & Rehabilitation*, 92(4), 519–530. <https://doi.org/10.1016/j.apmr.2010.11.015>

- Glasgow, R.E., Chambers, D. 2012. Developing robust, sustainable, implementation systems using rigorous, rapid and relevant science. *Clinical and Translational Science*, (5)48–55. <https://doi.org/10.1111/j.1752-8062.2011.00383.x>
- Gray, L. M., Wong-Wylie, G., Rempel, G. R., & Cook, K. (2020). Expanding qualitative research interviewing strategies: Zoom video communications. *The Qualitative Report*, 25(5), 1292-1301. <https://doi.org/10.46743/2160-3715/2020.4212>
- Griffin-Musick, J. R., Off, C. A., Milman, L., Kincheloe, H., & Kozlowski, A. (2020). The impact of a university-based intensive comprehensive aphasia program (ICAP) on psychosocial well-being in stroke survivors with aphasia. *Aphasiology*. <https://doi.org/10.1080/02687038.2020.1814949>
- Griffin-Musick, J. R., Jakober, D., Sallay, A., Milman, L., & Off, C. A. (2021). Cognitive-linguistic outcomes from an intensive comprehensive aphasia program implemented by graduate student clinicians. *Aphasiology*. <https://doi.org/10.1080/02687038.2021.1937920>
- Gunning, D., Wenke, R., Ward, E. C., Chalk, S., Lawrie, M., Romano, M., Edwards, A., Hobson, T., & Cardell, E. (2017). Clinicians' perceptions of delivering new models of high intensity aphasia treatment. *Aphasiology*, 31(4), 406–426. <https://doi.org/10.1080/02687038.2016.1236359>
- Hallowell, B. (2017). *Aphasia and Other Acquired Neurogenic Language Disorders: A Guide for Clinical Excellence*. Plural Publishing, Inc.
- Hanna, P. (2012). Using internet technologies (such as Skype) as a research medium: A research note. *Qualitative Research*, 12(2), 239–242. <http://dx.doi.org/10.1177/1468794111426607>
- Harry, A., & Crowe, S. F. (2014). Is the Boston Naming Test still fit for purpose? *The Clinical Neuropsychologist*, 28(3), 486–504. <https://doi.org/10.1080/13854046.2014.892155>
- Helm-Estabrooks, N., Nicholas, M., & Helm, S. A. (2000). *Sentence production program for aphasia*. Pro-Ed.
- Hoover, E. L., & Carney, A. (2014). Integrating the iPad into an intensive, comprehensive aphasia program. *Seminars in Speech & Language*, 35(1), 25–37. <https://doi.org/10.1055/s-0033-1362990>
- Hoover, E. L., Caplan, D. N., Waters, G. S., & Carney, A. (2017). Communication and quality of life outcomes from an interprofessional intensive, comprehensive, aphasia program (ICAP). *Topics in Stroke Rehabilitation*, 24(2), 82–90. <https://doi.org/10.1080/10749357.2016.1207147>

- Hope, T. M. H., Leff, A. P., Prejawa, S., Bruce, R., Haigh, Z., Lim, L., Ramsden, S., Oberhuber, M., Ludersdorfer, P., Crinion, J., Seghier, M. L., & Price, C. J. (2017). Right hemisphere structural adaptation and changing language skills years after left hemisphere stroke. *Brain: A Journal of Neurology*, 140(6), 1718–1728. <https://doi.org/10.1093/brain/awx086>
- Howe, T., Davidson, B., Worrall, L., Hersh, D., Ferguson, A., Sherratt, S., & Gilbert, J. (2012). “You needed to rehab ... families as well”: Family members’ own goals for aphasia rehabilitation. *International Journal of Language & Communication Disorders*, 47(5), 511–521. <https://doi.org/10.1111/j.1460-6984.2012.00159.x>
- Hula, W. D., Cherney, L. R., & Worrall, L. E. (2013). Setting a research agenda to inform intensive comprehensive aphasia programs. *Topics in Stroke Rehabilitation*, 20(5), 409–420. <https://doi.org/10.1310/tsr2005-409>
- Johnson, L., Basilakos, A., Yourganov, G., Bo Cai, Bonilha, L., Rorden, C., & Fridriksson, J. (2019). Progression of aphasia severity in the chronic stages of stroke. *American Journal of Speech-Language Pathology*, 28(2), 639–649. https://doi.org/10.1044/2018_ajslp-18-0123
- Jordan, N., & Deutsch, A. (2021). Why and how to demonstrate the value of rehabilitation services. *Archives of Physical Medicine and Rehabilitation*. <https://doi.org/10.1016/j.apmr.2021.06.028>
- Kincheloe, H., Off, C., Murphy, M., Griffin-Musick, J., Murray, K., & Jakober, D. (2022). “We all have coping and communication problems” Experiences of stroke survivors living with aphasia and graduate student clinicians who participated in a telehealth interprofessional psychoeducation and wellness group. *Aphasiology*. <https://doi.org/10.1080/02687038.2021.2020716>
- Lam, J. M. C., & Wodchis W. P. (2010). The relationship of 60 disease diagnoses and 15 conditions to preference-based health-related quality of life in Ontario hospital-based long-term care residents. *Medical Care*, 48(4), 380–387. <https://doi.org/10.1097/mlr.0b013e3181ca2647>
- Leff, A., & Crinion, J. (2021). Clinical effectiveness of the Queen Square Intensive Comprehensive Aphasia service for patients with post-stroke aphasia. <https://doi.org/10.31219/osf.io/ckq6u>
- Mitchell, C., Gittins, M., Tyson, S., Vail, A., Conroy, P., Paley, L., & Bowen, A. (2020). Prevalence of aphasia and dysarthria among inpatient stroke survivors: Describing the population, therapy provision and outcomes on discharge. *Aphasiology*. <https://doi.org/10.1080/02687038.2020.1759772>
- Mohr, B. (2017). Neuroplasticity and functional recovery after intensive language therapy in chronic post stroke aphasia: Which factors are relevant?. *Frontiers in human neuroscience*, 11, 332. <https://doi.org/10.3389/fnhum.2017.00332>

- Monnelly, K., Marshall, J., & Cruice, M. (2021). Intensive comprehensive aphasia programmes: A systematic scoping review and analysis using the TIDieR checklist for reporting interventions. *Disability and Rehabilitation*, 1–26. <https://doi.org/10.1080/09638288.2021.1964626>
- Nicholas, M., Pittmann, R., Pennington, S., Connor, L. T., Ambrosi, D., Brady Wagner, L., Hildebrand, M., & Savastano, M. (2021). Outcomes of an interprofessional intensive comprehensive aphasia program’s first five years. *Topics in Stroke Rehabilitation*, 1–17. <https://doi.org/10.1080/10749357.2021.1970452>
- Noble, H., & Smith, J. (2015). Issues of validity and reliability in qualitative research. *Evidence-Based Nursing*, 18(2), 34–35. <http://dx.doi.org/10.1136/eb-2015-102054>
- Off, C. A., Griffin, J. R., Murray, K. W., & Milman, L. (2019). Interprofessional caregiver education, training, and wellness in the context of a cohort model for aphasia rehabilitation. *Topics in Language Disorders*, 39(1), 5–28. <https://doi.org/10.1097/TLD.0000000000000171>
- Oppong, S. H. (2013). The problem of sampling in qualitative research. *Asian Journal of Management Sciences and Education*, 2(2), 202-210.
- Palmer, R., Hughes, H., & Chater, T. (2017). What do people with aphasia want to be able to say? A content analysis of words identified as personally relevant by people with aphasia. *PloS One*, 12(3), e0174065. <https://doi.org/10.1371/journal.pone.0174065>
- Persad, C., Wozniak, L., & Kostopoulos, E. (2013). Retrospective analysis of outcomes from two intensive comprehensive aphasia programs. *Topics in Stroke Rehabilitation*, 20(5), 388–397. <https://doi.org/10.1310/tsr2005-388>
- Power, E., Bryant, L., & Shrubsole, K. (2020). Making aphasia implementation stick: Ensuring the sustainability of implementation. *Speech, Language and Hearing*, 23(1), 25–29. <https://doi.org/10.1080/2050571X.2019.1707349>
- Rodriguez, A. D., Worrall, L., Brown, K., Grohn, B., McKinnon, E., Pearson, C., Van Hees, S., Roxbury, T., Cornwell, P., MacDonald, A., Angwin, A., Cardell, E., Davidson, B., & Copland, D. A. (2013). Aphasia LIFT: Exploratory investigation of an intensive comprehensive aphasia programme. *Aphasiology*, 27(11), 1339–1361. <https://doi.org/10.1080/02687038.2013.825759>
- Rogalski, Y., & Edmonds, L. A. (2008). Attentive Reading and Constrained Summarisation (ARCS) treatment in primary progressive aphasia: A case study. *Aphasiology*, 22(7–8), 763–775. <https://doi.org/10.1080/02687030701803796>

- Rose, T., Worrall, L., McKenna, K., Hickson, L., & Hoffmann, T. (2009). Do people with aphasia receive written stroke and aphasia information? *Aphasiology*, 23(3), 364–392. <https://doi.org/10.1080/02687030802568108>
- Rose, M. L., Cherney, L. R., & Worrall, L. E. (2013). Intensive comprehensive aphasia programs: An international survey of practice. *Topics in Stroke Rehabilitation*, 20(5), 379–387. <https://doi.org/10.1310/tsr2005-379>
- Rose, T. A., Balse, A., Osmond, S., Poon, A., Simons, N., & Wallace, S. J. (2018). Aphasia education: Speech-language pathologists' perspectives regarding current and optimal practice. *Aphasiology*, 32(8), 967–988. <https://doi.org/10.1080/02687038.2018.1472366>
- Rose, T. A., Wallace, S. J., & Leow, S. (2019). Family members' experiences and preferences for receiving aphasia information during early phases in the continuum of care. *International Journal of Speech-Language Pathology*, 21(5), 470–482. <https://doi.org/10.1080/17549507.2019.1651396>
- Rose, M. L., Pierce, J. E., Scharp, V. L., Off, C. A., Babbitt, E. M., Griffin-Musick, J. R., & Cherney, L. R. (2021). Developments in the application of Intensive Comprehensive Aphasia Programs: An international survey of practice. *Disability and Rehabilitation*, 1–15. <https://doi.org/10.1080/09638288.2021.1948621>
- Shelton, R. C., Cooper, B. R., & Stirman, S. W. (2018). The sustainability of evidence-based interventions and practices in public health and health care. *Annual Review of Public Health*, 39, 55–76. <https://doi.org/10.1146/annurev-publhealth-040617-014731>
- Shrubsole, K., Worrall, L., Power, E., & O'Connor, D. A. (2019). Barriers and facilitators to meeting aphasia guideline recommendations: What factors influence speech pathologists' practice? *Disability and Rehabilitation: An International, Multidisciplinary Journal*, 41(13), 1596–1607. <https://doi.org/10.1080/09638288.2018.1432706>
- Simmons-Mackie, N., & Kagan, A. (2007). Application of the ICF in aphasia. *Seminars in Speech & Language*, 28(4), 244–253. <https://doi.org/10.1055/s-2007-986521>
- SocioCultural Research Consultants, (2018). Dedoose, Version 8.0.35 [Computer software]. Los Angeles, CA: Author. Retrieved from <http://dedoose.com>
- Stahl, B., Mohr, B., Dreyer, F. R., Lucchese, G., & Pulvermüller, F. (2016). Using language for social interaction: Communication mechanisms promote recovery from chronic non-fluent aphasia. *Cortex: A Journal Devoted to the Study of the Nervous System and Behavior*, 85, 90–99. <https://psycnet.apa.org/doi/10.1016/j.cortex.2016.09.021>
- Teasell, R., Mehta, S., Pereira, S., McIntyre, A., Janzen, S., Allen, L., Lobo, L., & Viana, R. (2012). Time to rethink long-term rehabilitation management of stroke patients. *Topics in Stroke Rehabilitation*, 19(6), 457–462. <https://doi.org/10.1310/tsr1906-457>

- Trebilcock, M., Worrall, L., Ryan, B., Shrubsole, K., Jagoe, C., Simmons-Mackie, N., Bright, F., Cruice, M., Pritchard, M., & Le Dorze, G. (2019). Increasing the intensity and comprehensiveness of aphasia services: Identification of key factors influencing implementation across six countries. *Aphasiology*, 33(7), 865–887. <https://doi.org/10.1080/02687038.2019.1602860>
- Trebilcock, M., Shrubsole, K., Worrall, L., & Ryan, B. (2021). Development of an online implementation intervention for aphasia clinicians to increase the intensity and comprehensiveness of their service. *Disability and Rehabilitation*, 1–10. <https://doi.org/10.1080/09638288.2021.1910867>
- U.S. Department of Health and Human Services. (2015). *What is aphasia? - Types, causes and treatment*. National Institute of Deafness and Other Communication Disorders. <https://www.nidcd.nih.gov/health/aphasia#what>.
- Virani, S. S., Alonso, A., Benjamin, E. J., Bittencourt, M. S., Callaway, C. W., Carson, A. P., Chamberlain, A. M., Chang, A. R., Cheng, S., Delling, F. N., Djousse, L., Elkind, M. S. V., Ferguson, J. F., Fornage, M., Khan, S. S., Kissela, B. M., Knutson, K. L., Kwan, T. W., Lackland, D. T., ... Tsao, C. W. (2020). Heart disease and stroke statistics - 2020 update: A report from the American Heart Association. *Circulation*, 141(9), e139–e596. <https://doi.org/10.1161/CIR.0000000000000757>
- Wallace, S. J., Worrall, L., Rose, T., Le Dorze, G., Cruice, M., Isaksen, J., Kong, A. P. H., Simmons-Mackie, N., Scarinci, N., & Gauvreau, C. A. (2017). Which outcomes are most important to people with aphasia and their families? An international nominal group technique study framed within the ICF. *Disability & Rehabilitation*, 39(14), 1364–1379.
- Wallace, S. J., Worrall, L., Rose, T., Le Dorze, G., Kirke, E., & Kolomeitz, D. (2018). Report from ROMA: An update on the development of a core outcome set for aphasia research. *Aphasiology*, 32, 241–242. <https://doi.org/10.1080/02687038.2018.1487020>
- Welch, C., & Piekkari, R. (2006). Crossing Language Boundaries: Qualitative Interviewing in International Business. *MIR: Management International Review*, 46(4), 417–437. <https://doi.org/10.1007/s11575-006-0099-1>
- Winans-Mitrik, R. L., Hula, W. D., Dickey, M. W., Schumacher, J. G., Swoyer, B., & Doyle, P. J. (2014). Description of an intensive residential aphasia treatment program: Rationale, clinical processes, and outcomes. *American Journal of Speech-Language Pathology*, 23(2), S330–S342. https://doi.org/10.1044/2014_ajslp-13-0102
- Worrall, L., Sherratt, S., Rogers, P., Howe, T., Hersh, D., Ferguson, A., & Davidson, B. (2011). What people with aphasia want: Their goals according to the ICF. *Aphasiology*, 25(3), 309–322. <https://doi.org/10.1080/02687038.2010.508530>
- Zoom Video Communications, Inc. (2020). *ZOOM cloud meetings* (Version 4.6.9) [Mobile app]. App Store. <https://apps.apple.com/us/app/zoom-cloud-meetings/id546505307>

Appendices

Appendix A: Script for the Qualitative Interviews on ICAP Sustainability

Introduction

Hello, thank you for joining the meeting. My name is _____. I am a graduate student/professor at Idaho State University/Montana State University.

Consent Form and Recording

I am going to start recording now and then we will begin.

~Start recording~

You already signed and we received your consent form, but before we begin do you have any questions or concerns?

**If they ask about their classification from the 2020 Survey article, respond; We are not able to provide detailed feedback on where your program data was assigned/classified for each element - This was part of the IRB - human subject restrictions.*

Ask follow up questions if you feel appropriate based on responses or need more information than was provided

First I want to begin with some questions on the **motivation** for your program and its **implementation**.

- What gap or need prompted your ICAP or mICAP implementation?
- What specifically led you to adopt the ICAP model?
 - *Potential follow up question:*
 - When were you first introduced to ICAPs?
 - What made you excited about the ICAP and ultimately decide to do it?
 - How do you feel about ICAPs in general, in comparison to other treatment models?
- What **barriers** to implementation have you or your program experienced?
 - *Potential follow up questions:*
 - What pushback did you get when introducing the idea of creating the ICAP?
 - What was the most difficult part of implementing your program?
- What critical/essential **supports** exist that your ICAP could not run without?
 - *Potential follow up questions:*
 - What infrastructure did you already have in place that made it easier to form the ICAP?
 - Did you collaborate with other individuals involved in an ICAP before or while establishing your own ICAP?
 - Who and/or what were the most significant factors in creating the ICAP?
 - Do you feel the ICAP would continue to exist if you were to leave? If not, what would need to happen so it would?
- Looking back, what advice would you give to new/emerging ICAPs or what is something you wish you had done differently?
 - *Potential follow up question:*

- Tell me about why you didn't do that/follow that advice originally and why would you recommend it now?

Thank you. Now I have some questions about the **logistics** of your program.

- Was it difficult to recruit at first?
 - How about now?
 - *Potential follow up questions:*
 - How did you address recruitment issues then and/or now?
 - Do you have high return rates each year?
 - How many are new recruits?
 - How many are local?
- Can you tell us about the staffing for your program?
 - Do you use grad students for implementation?
 - If so, to what extent? How are graduate students utilized?
- Can you describe the training for the clinicians, supervisors, or grad students?
- Are there areas for development or activities you would like to include in your ICAP but have not added and if so what are they?
 - *Potential follow up question:*
 - Why have you not yet included them and why do you want to include them?
- What types of interprofessional activities do you include and how are they executed?
 - Do you practice collaboratively or separately?
 - *Potential follow up question:*
 - How do you feel interprofessional care contributes to your program?
- Please describe any caregiver supports or activities for your ICAP, if any.

Thank you. We have just one last series of questions about your **plans or modifications** to your program.

- What changes have you made throughout the implementation process? i.e. logistical changes? patient needs? clinician needs? administrative support? funding? resources?
 - What spurred these changes?
 - Please describe what barriers, if any, you faced implementing these changes.
- Moving forward, what elements would you like to either add or takeaway, or any adaptations you would like to make to your ICAP?
 - *Potential follow up question:*
 - What plans do you have for your ICAP in the future?
- What research do you wish you had on ICAPs that you do not have now?
- *Other potential questions:*
 - What mission statements guide your decisions for the ICAP?
 - What core principles do you base your program on?
 - Have you ever thought about discontinuing the ICAP? If so, why?
- *If time:* How have you adapted to COVID? Will you continue any of those changes?

Thank you for your thoughtful answers. Is there anything else you would like to share with us about your program? Any questions?

Thank you for joining, and have a good rest of your day.
~End recording~

Appendix B: Codebook

Code	Definition	Example
Advocacy	<p>Active positive explanation or engagement in the ICAP/mICAP model or aphasia rehabilitation</p> <p>Anytime the benefits/ advantages of the ICAP/mICAP model or aphasia rehabilitation is promoted</p>	<p>“People who don't do not care for patients with aphasia don't really get it. And the patients can't speak for themselves, obviously, so they don't have a lobby and we need to be their lobby. So get the word out that the aphasia therapy is working.”</p> <p>“So I think that's an important thing to do, just to introduce the form to SLPs so they know. Because I can also feel that sometimes when I talk about it, when the SLPs haven't been doing it in real life, they don't really understand what it's all about. So they really need to do it before they can feel how it is to do that kind of treatment.”</p>
Brainstorming	<p>Individual or group think to determine an alternative/solution to an observed issue or limitation, or way to improve/modify the program, or creating a plan of action either to develop the program or while the program is already established</p> <p>Can be in response to a specific issues, and an ongoing dynamic process as the program develops</p> <p>Scaling-up & scaling-down</p> <p>Also include therapeutic motivation, or the motivation for administering therapy in an ICAP/mICAP format</p>	<p>“There are a few that are more about the outdoors and community feel and kind of recreational. So then we started brainstorming ‘gosh well, maybe we could do something like this’. Then we had to really piecemeal our ideas and also streamline them because they started with very vast ideas that were just thrown out there, like a drum circle or maybe we could have art class. So our students were really thinking outside the box.”</p> <p>“So our students were really thinking outside the box. And then we had to decide ‘okay, are we going more of a recreational route and what is our motivation there versus more of a therapeutic route?’”</p>
Buy-in	belief (and support) in the ICAP/mICAP model and aphasia rehabilitation from	“But he [the boss] was convinced pretty fast that this is something special. People come from all over [X] to us so this is

	<p>patients, other clinicians, other stakeholders, etc.</p> <p>Active or passive</p>	<p>unique. That's when he also started engaging himself in this ward and defending it against attacks from basically everywhere.”</p>
Participant candidacy and cohort characteristics	<p>Participant characteristics for eligibility (inclusionary and exclusionary traits) to participate as a member of the cohort in the ICAP/mICAP model</p> <p>Any characteristics/traits that apply to the cohort as a whole (i.e. “alive”, “vibrant”, or willing to be challenged, etc.)</p>	<p>“The other thing is, also in [X] we mainly concentrate on patients aged 50 or a mean age is 50 years. But with the demographic changes we are seeing, I'm not entirely sure if an ICAP is also something that an 80 year old person would like to have or would benefit from. So that’s something we need to find out more. And finally, we need to find out, is an ICAP also applicable for patients suffering from progressive aphasia.”</p> <p>“And starting to ask yourself the question of ‘is this just one person who's doing this’ and or ‘is it regularly happening with certain people or certain profiles’ and trying to get to the bottom of that. We didn't really have that. But I’m just thinking ahead that those would be things that we could do in the future to help with candidacy.”</p> <p>“I know that many people were really afraid that they were too brain fatigued that they wouldn't tolerate that kind of treatment. But we actually saw the opposite. When they came down and they started to get going they became much more alive and vibrant so they were all gaining from the intensive treatments.”</p>
Caregivers and care partners	<p>Unpaid/untrained family/friends/etc. who provide care to the PWA outside of the ICAP/mICAP</p> <p>May be in a position to support/care (emotional/physical/etc.) for the individual with aphasia in improving their communication; family and friends of the PWA who could</p>	<p>“We spend lots of time educating the patients, but they are only half of the communication chain. So it's so valuable to also educate the receivers of aphasic communication, then to educate senders for aphasic recipients.”</p> <p>“At the beginning of every semester of our treatment program we have a family and student orientation.”</p> <p>“We also do a caregiver feedback survey</p>

	<p>be included in the ICAP/mICAP model to support communication</p> <p>May include; (Caregiver) Feedback (Caregiver) Resources</p>	<p>at the end of every semester where they get to actually share their perception of how the semester went for their loved one.”</p>
COVID	<p>Any reference to COVID or pandemic</p> <p>May include changes, adjustments, etc.</p> <p>May be negative or positive</p>	<p>“Well, sadly, the first year they almost had to stop the groups because, like many of the hospitals, they had to reduce rehabilitation activity in order to have hospital staff for the acute COVID patients available.”</p>
Data & documentation	<p>Information during the ICAP/mICAP that was collected and recorded, either for clinical guidance and/or for research</p> <p>May be logistical, or processes/systems of documentation</p> <p>Documentation at any point in the process - before program, during implementation, after program</p>	<p>“I think that's beneficial before designing a larger study where you're going to really demonstrate the effect or try to measure the effect and use that for stakeholders...so data, and then I think the other thing being the documentation piece. We had a lot of schedules. We use a lot of excel. We use Google sheets and Google drive. I think schedules were really helpful because we have schedules for the participants, schedules for the clinicians, for the masters clinicians...A huge part of the success is having a plan very clearly and where is this stuff happening.”</p>
Delivery models	<p>Any information related to both the format and the delivery of the program.</p> <p>Telehealth, in-person, etc.</p> <p>Telehealth Use of telehealth to administer the ICA/mICAP or to educate others about the ICAP/mICAP</p>	<p>“or those who couldn't relocate for financial or logistical reasons, they just simply couldn't get the treatment. Now that has actually changed with COVID because we have changed to a telehealth model and it's really been wonderful actually for us because we have been able to reach many more patients, in fact, the majority are actually out of State.”</p> <p>“Hence, at the moment, we are actually discussing changing the model to maybe add a two plus two weeks program with a break in between, because that will generate more money for the hospital.”</p>

		<p>“So we have quite a few participants from [X], but some of which were 1 to 3 hours away, so it was nice that it was via telepractice so that they could still participate.”</p>
Duration and intensity	<p>Any details on the total hours/ time/weeks/days of the program</p> <p>Any mention of dosage/dose</p>	<p>“And the third thing is, after a lot of feedback with our clients, we have reduced the time per day, the amount of hours per day because we were finding that the last couple of hours were not really prime hours for people.”</p> <p>“The biggest change was that this year we added a week and we added more individual sessions and the dedicated teams.”</p> <p>“But the insurance always kept telling us, ‘why are you doing six weeks? Three weeks seems to be pretty fine’. We had to find a compromise with them. So we went from seven to six weeks.”</p>
Evidence-base	<p>An evidence base/research agenda to establish the program, run the program and/or continue the program</p> <p>Or evidence/research desired or needed, or used to convince others of the ICAP/mICAP model usefulness</p> <p>Efficacy/effectiveness/efficiency of ICAP/mICAP model and/or aphasia rehabilitation</p>	<p>“In addition, I would really benefit from, at this point, seeing research on financial sustainability and how that affects funding, budgeting for ICAPs, where the money is going and how they deal with changes in the economy even, in the economics of healthcare.”</p> <p>“So it is very helpful to have those outside questions come in, because those are the questions that, eventually, if we're trying to bill for a service like this or have a code for a service, that's what insurance companies want to know. So it just makes you think what could happen years from now if we had really good evidence for this.”</p>
Expense	<p>The cost (time, money, resource allocations, space, etc.) of running the program, related to staffing, infrastructure, etc.</p>	<p>“I could supervise clinical fellows to run the program, that's a lot less expensive than a research SLP with CCCs.”</p> <p>“We see a lot of counseling needs that folks are not being served because either the counselor or the psychologist doesn't</p>

		really know about aphasia so they can't serve them, or it's very expensive or not covered by insurance.”
Funding	Sources of funding for the program to run properly Expense, sustainable funding, profitability, etc.	“One of the biggest barriers for continuing a program like this and making it have some longevity is funding.” “We also reduced the number of students we would take again to reduce the cost.” “I could supervise clinical fellows to run the program, that’s a lot less expensive than a research SLP with CCCs.”
Future directions	Information or elements that the program is desires or cites as a need in the future Will likely include bulk of research question	“I think we need more research on that timeline” “I would really benefit from, at this point, seeing research on financial sustainability and how that affects funding, budgeting for ICAPs, where the money is going and how they deal with changes in the economy even, in the economics of healthcare.”
Graduate students	Content describing graduate students (or undergraduate) involvement (or lack of) in any component or stage of the ICAP/mICAP Graduate student role play, research, student training	“mentoring the students through the process there's so much time involved that it actually made the program more expensive than if we just did it ourselves one to one without students.” “We had started a journal club review with a group of graduate students who had clients with aphasia.”
Group treatment	Any time or manner the cohort is treated as a whole or interacts together in structured and/or facilitated activities Formal or informal	“Yes. It depends a bit, but usually we have something which we call an exchange experience, which is a talking group. They would talk about how it is living there for aphasia and their experience from it.”
Interprofessional	The inclusion and/or exclusion of professionals other than the SLP in assessment/ treatment and the program overall May include mention of mental health services;	“So actually that was in [X]. Usually we have, in the rehab team, the neurologists, the SLP, the physiotherapist and also what you call an occupational therapist. But it didn't work that well with the [X] occupational therapists.”

	Information regarding participants and their families'/caretakers' emotional and mental health	"Every patient also receives physical therapy, because most of our patients also suffer from spasticity. 98% or 90% of our patients suffer from a stroke. So that's what everyone gets. Unfortunately we don't have resources for occupational therapy very much."
Leadership	Roles described in the ICAP/mICAP or institution (university, hospital, etc.) setting on leading or doing the overarching organization and running of the program	<p>"That took a heck of a lot of discussion and if [X] and I hadn't been having that discussion I'm not sure who would have, weighing all the factors brainstorming."</p> <p>"So I think that just speaks to the complexity of the program and how you would really need to train a therapist sufficiently, and really it's almost like intensive treatment yourself. It's very intense trying to really get a handle on the program to take it over."</p> <p>"So it depends on the staff and it also depends on the leadership of the hospital, because if they want to stop the program they can just do it."</p>
Location	<p>Physical location of the program</p> <p>May include specific drawbacks or advantages of that location</p>	"so, people want to come to [X], so I think that was probably also a draw. People who are retiring, we have some families who are like 'oh yeah like we'd love to, we're retiring soon, maybe we'll go to [X] for a semester'"
Networking	Prior or existing or developing relationships or connections (with other individuals, organization, etc.)	"So this year, [X], she actually posted on the SIG website. We have a local community of folks who work with clients with aphasia in the [X], [X], [X] region, and we meet kind of quarterly."
Outcomes	<p>Any changes/results of the program for participants, care partners, cohort, graduate students, or other clinicians</p> <p>May be positive or negative outcomes</p>	"We had another case in the past of somebody who is apraxic and referred to our program and he shared that he felt he got the same level of satisfaction out of the program that our other folks with aphasia. So it might be interesting to see if other ICAPs end up letting other diagnoses into their program that benefit from an intensive model"
Patient-directed content	Activities or content or therapies/interventions that	"Some of our participants themselves have interesting interests they would like

	were initiated, prompted, organized or directed by the participant's own initiative and guided by their own interests and preferences	to share or talk about or professions and something that they would like to share, so then sometimes some of them take the data and organize and music evening exchange, they show each other than music on the iPads and iPhones and stuff like that and talk about music, or they do a little photo course because someone could on the iPhone or things like that yeah."
Program access	<p>Participant's ability to access a program, or barriers from the perspective of the participant to enrolling in program</p> <p>May include expenses, regional proximity, participant characteristics, etc.</p> <p>*Likely to be double or triple coded</p>	"I don't want it to become a country club for rich people with aphasia, but in some respects there's a certain socioeconomic class that can access our program where others can't"
Program feedback	<p>Information and opinions and perspectives provided from those involved in the ICAP/mICAP (caregivers, PWAs, and involved clinicians)</p> <p>Either at the end or during/throughout the program</p> <p>Expectations of the program</p>	<p>"So with my personal clients I kept those lines of communication open via email, via phone calls and then some of their care partners would join in on the last day to give feedback as well."</p> <p>"We also do a caregiver feedback survey at the end of every semester where they get to actually share their perception of how the semester went for their loved one."</p>
Program, facility, institution, or person's reputation	Regard or notoriety of a program that either supports or hinders program implementation or continuation	"She has connections with neuropsychologists, neurologists, and rehabilitation clinics. We're a known brand of aphasia lab research. So I think that we had some leg up there in terms of when we were trying to recruit."
Recruitment	<p>Identification and methods of how the program found and enrolled participants</p> <p>May include elements of demand for the program, either early in the program or ongoing demand</p>	<p>"But beyond that I was also trying to tell them about our program so that they would send us people. So it was a recruitment, but I think it was a respectful recruitment."</p> <p>"So I think that we had some leg up there in terms of when we were trying to</p>

	May include mentions of an established pool or need for services	recruit. So I think that was useful and also just established ways of recruiting. How do you recruit in general?"
Regional proximity	<p>The distance of participants from the program from their permanent residence</p> <p>May include how and how long far they need to travel to a program; may be where they live, adjust to the move</p>	<p>"The second change, or the most profound change that we've done now is to implement it in [X] so they don't have to go to [X]."</p> <p>"We usually would get a lot of patients from outside the [X] area where the clinic is. So I would say 75% are outside a day trip away coming to the clinic."</p>
Space	Physical space and infrastructure that the ICAP/mICAP takes place in	"Also having the building already, so we have a lab that has a space, and then we were able to...Because we were providing an academically focused intervention, it was really useful that we were in a rehab sciences building where we had classrooms."
Staffing	General statements about the staff running the ICAP/mICAP	"In order also to reduce workload on the administrative staff, we employ a full time staff split into two persons who are dealing only with doing the logistics all year round."
Stakeholders	Any mention of those who have a stake in ICAPs/mICAPs - i.e. insurance companies, etc.	"I think that's beneficial before designing a larger study where you're going to really demonstrate the effect or try to measure the effect and use that for stakeholders."
Structure & processes	<p>Any process related to the ICAP/mICAPs that was organized and set up to be swifter and easier</p> <p>May be procedural in nature; streamline; etc.</p>	<p>"We spent a lot of energy on streamlining the application process and the onboarding process."</p> <p>"Why is this necessary and why does it have to be at the hospital? So we created templates and streamlined this."</p>
Technology	The use of technology during the ICAP/mICAP	"One other thing, as I told you, apps and tablets and devices were a blind spot, and we managed to create a position for an SLT who had experience in natural language processing. She had a position with Apple for a few years and we got her on board."
Training	Training and/or education given to graduate students,	"I just see that as a huge missing piece to serve the family. We're doing

	<p>clinicians, allied professionals, family, caregivers, etc.</p> <p>May also include education and teaching others about the ICAP/mICAP, including specific elements such as the cohort, intensity, etc.</p> <p>Teaching can include exposure or formal teaching seminars/tutorials</p>	<p>communication training and things like that to give them some techniques and things like that.”</p>
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Appendix C: Codes and Example Excerpts

Theme: Subtheme	Excerpts Example 1	Excerpts Example 2	Excerpts Example 3
Supports			
<i>Operationalizing Procedures: Manualizing Program Procedures and Processes</i>	“A huge part of the success is having a plan very clearly”	“We created a lot of templates and how-tos and instructions and manuals on how to deal with insurers... So basically an instruction manual for the ward in order to guarantee the functioning of the unit.”	“We spent a lot of energy on streamlining the application process and the onboarding process... We basically wrote a letter for each patient describing deficits and what we're going to do.”
<i>Operationalizing Procedures: Training and Onboarding</i>	“I think that's an important thing to do, just to introduce the form to SLPs so they know. Because I can also feel that sometimes when I talk about it, when the SLPs haven't been doing it in real life, they don't really understand what it's all about. So they really need to do it before they can feel how it is to do that kind of treatment.”	“I think that also means for sustainability - so the idea that if you have those things written out you can train other people.”	“We actually have a promotional video that was created our first year that we did the program by our media department. So we shared the video with them. They're assigned journal articles to review ahead of time... Also, this year we really wanted them to have some observation of performing aphasia intervention via telepractice, and so they were assigned a video.”
<i>Operationalizing Procedures:</i>	“I needed to have more effective	“I think otherwise having really open	“That’s why you have your system, and so

Team Connection and Communication	communication. This year we assigned teams...this is the team that is working with this individual and you all are the dedicated team that will have regular communication with one another...It worked so much better. I feel like this year was actually really successful, and it was extremely rewarding for us.”	communication, so making sure that there's a space for clinicians to communicate and debrief with one another and talking about the day or the week or something about the things that worked well and the things that didn't seem to work well.”	you trust the process but also communicating very much early on so people know who's going to do what.”
<i>Operationalizing Procedures:</i> Space and Resources	“Also having the building already...we didn't have to rent space in a classroom to provide a simulated college environment. We could just reserve those classrooms.”	“Size and also the footprint of how the office is laid out and number of rooms. So that's just the support - the available space is one kind of support.”	“And of course, probably technology - we do use some technology as well. So those are kind of the things I would say that we couldn't do without.”
<i>Intentional Programmatic Improvements:</i> Stakeholder Commitment and Expectations	“Then another thing is really careful interviewing of the participant and their family and interacting with them so that they really understand what the program itself is and what's going to be expected of them and what their goals are, even before you enroll them and consent them.”	“Make sure you have all the stakeholders on board and that they know what the level of commitment is.”	“So that's one thing and then the last bit I would say, we also implemented a satisfaction survey. At the end of every semester the participants would complete a survey, as well as their families, asking about ‘how is this aspect of the program.’”
<i>Intentional Programmatic Improvements:</i> Intentional Recruitment Practices	“I was also trying to tell them about our program so that they would send us people. So it was recruitment, but I think it was a respectful recruitment.”	“So it was just making sure that we did a proper interview process and had all the medical records. Really recruiting for us at our end was a lot smaller. We're not taking as	“We actually have people reaching out to us all the time, who I then need to consent, start some testing and screening with. And then they're like ‘when can I join?’ and I said ‘I

		many people as some of the programs.”	don't know yet, we have to look at enrollment’. So, at the beginning though, I believe it was a little slower...I think word of mouth and working with other clinics in the area has really helped. So just being familiar with people now has made recruitment easier.”
<i>Intentional Programmatic Improvements: Intensity Optimization</i>	“The other change is we reduced the amount of time from seven weeks to six weeks in order to serve more patients per year, because we cannot increase our staffing. That's prohibited from a financial point of view and we cannot increase our beds because we don't have more room in our hospital.”	“So the first changes we did were to get more therapists and smaller groups so the workload wasn't too high because it's so intensive.”	“And the third thing is, after a lot of feedback with our clients, we have reduced the time per day- the amount of hours per day because we were finding that the last couple of hours were not really prime hours for people. They were kind of fatigued and most of our clients, when we sort of did an exit interview, said they would much rather have 60% of the hours per day at 60% of the cost. So those are the three areas.”
<i>Intentional Programmatic Improvements: Participant Candidacy and Cohort Characteristics</i>	“So, because it was via telepractice, this summer we actually had an individual from Vermont and because of licensure rules due to COVID we were actually able to treat her. We could not do that for every state depending on their licensing regulation. But she was able to participate.”	“So it seemed like there was a need, and we had identified the need. So there was a line of people who were ready to do something like that.”	“It was depending on what kind of patients you had on site. Actually, we had groups. They could also be mixed, it wasn't only aphasia. It was apraxia of speech, sometimes also dysarthria and voice problems, so it was a little bit different depending on the groups that we had.”

<i>Passion and Commitment to the Model:</i> Program Leader	“We put in a lot of work. My partner and I - we left together. And in finding suitable successors and in communicating to everyone that the ward will not cease to exist just because of us leaving.”	“Obviously personnel, that's completely the biggest one. We have one person on our team who has really spearheaded this and without her it would not have happened. It happens to be my clinic, but in many respects it's her program. So that critical one person with a huge passion to do it clinically and then another person (would be me) with a huge passion to do it, who has administrative management experience.”	“I don't think it's the time. Assuming there'd be other people on board to take our place in terms of number of hours available. It's not the time. It's the passion for sure.”
<i>Passion and Commitment to the Model:</i> Theoretical Foundation and Motivation	“Now that happened also because of research and the neuroscientific evidence suggesting that these programs should work and also in the aphasia realm specifically, the success of previous ICAPs.”	“They did a fair amount of research, obviously, to get the program up and running and approved by the IRB with their rationale for why they were even running the Program.”	“These are people who were trying to go to college so then their parents are like, ‘well, I was going to pay for them to go to college and have tuition, this is cheaper than that’ and like ‘this is going to help them get there’. So there were other choices being made around that.”
Barriers			
<i>Limitations in Research:</i> Participant Candidacy	“This year we've had varying levels of severity as well that we've been a little nervous about...So there were definitely some lessons learned, but perhaps maybe some more research on the severity levels and how an ICAP can	“I don't know everything about it. I know that if you get a stroke in [X] you usually can get rehab for a year or two. And that's many, many hours, so that means that they have different methods of rehab forms that have been around	“So maybe since there is a lot of new science in the field, maybe it shouldn't be that intense. More like a longer program with a few less hours. It's so different for different people. For some people it's really perfect to go for three weeks

	work for somebody with different levels of deficit.”	for a long time that are really well tried-out but haven't been studied in the universities, because they are not on that level. So what I feel is that we need many more studies on the different methods and what methods are good together with what kind of profile.”	and do that intensively. For others it's perfect to have it for maybe two months, so it's also how it fits into your regular life.”
<i>Limitations in Research:</i> Program Intensity and Dosage Demands	“It's just tough. I wish there were something that would give us a little bit more information about intensity and timing - how much.”	“We need to know what would be the ideal treatment time because I know many of the ICAP definitions say about six weeks, four weeks, three weeks. And I think we need more research on that timeline and, as I said before, I would also love to look into more repetition treatments and the effect of that.”	“And I think for select patients that's how it should be done because evidence is ever increasing that only intensive aphasia therapy will really work. And I personally believe that the many studies that did not show benefits in the past simply were not intensive enough or powered enough. So, yes, it's the “I” in intensive that makes a difference.”
<i>Limitations in Research:</i> Efficacy of ICAPs/mICAPs	“We wanted to design the program thinking of research in the background of it. So we wanted to do an assessment that was quantitative and qualitative enough, and aphasia friendly. It's tough because there's the assessments - I don't want it to be a burden for friends with aphasia, but I want to gather all of that good information.	“I mean there are really good articles on how to do it and there are new ones coming, but somehow it feels like there are quite a few methods that haven't been appreciated enough, or it has not been studied so that it's not evidence-based but it's practical functioning.”	“Sometimes I am struck by how much information even neurologists lack on what is really necessary to treat aphasia. I believe there's this fatalistic stance that after one year nothing will happen anyway, so it's really not worth the effort. And having worked on the aphasia ward for the last 10 years really convinced me otherwise.”

<i>Resource Restrictions:</i> Allocation of Time	“But because of all of her other responsibilities, I don't think she would have time to be the coordinator of it. So I have a feeling that they would figure out a way certainly, but it does certainly need somebody who takes the reins on everything.”	“I am the director of the ICAP and just on my end it is a huge time commitment, as well as balance with my current caseload, and assisting with some coursework. And so personally it just is, by the end, it is extremely rewarding and I'm so glad that we did it, but leading up to it and during it is a big, big time commitment.”	“I feel like a lot of it was telling her [staff member] what she would be doing, and how intense it is. Sometimes you have to work on a weekend, sometimes you may have to work late at night. Not all the time, some days you'll have a really great day or you'll have two weeks where you don't have as much to do. That's great, but generally these are different things you might experience.”
<i>Resource Restrictions:</i> Staff Training	“I would like to think that we would mentor somebody else under our wings, but if some disaster happened that we were both unavailable, it's not going to happen. I don't think it would happen without a lot of lead time.”	“Right now I think that the program could continue if I left. But that said, I think that I would feel a strong ethical sense of ethical responsibility to stay with it right now. That's because it is such a specialized program that the amount of training that it would take to get someone fully up to date on how the program runs would be substantial.”	“I mean there was so much learning that happened to really fully take over the program so that she can focus on her dissertation. So I think that just speaks to the complexity of the program and how you would really need to train a therapist sufficiently, and really it's almost like intensive treatment yourself. It's very intense trying to really get a handle on the program to take it over.”
<i>Program Accessibility:</i> Number of Participants	“We rented space from UBC (University of British Columbia) in the summer and then we were able to take like 5, 6, 7 people at a time. But then we did the math and we realized that the cost	“And that [is important that] you could have a small group preferably and individual training so enough with the SLPs also. So in the beginning we had a bit too few people. So we had really long days	“We're only trying to recruit between four to eight people most. So that's our quota for the semester.”

	of renting that space actually added \$1500 per client to the Program. So we just stopped that and we've taken it to our own existing clinic. But we only do three or four at a time because that's all we can manage space-wise.”	and we tried to minimize that burden... Yeah, not more than three people for one SLP for example.”	
<i>Program Accessibility: Participant Candidacy</i>	“We just realized it was burning some for some of our folks with aphasia... Just we took out some things that we didn't necessarily give us as much information that we thought we needed. Then we shortened it.”	“So we did a lot of screening at the time when the patients were not with us. So we are pretty certain that they fit into our program when they arrive. And that's something we did in the early times.”	“Well I think there have been some changes both to the intensity of the language groups in the treatment we have, but that might actually be more dependent on who the participants are each time we have a group.”
<i>Program Accessibility: Program Affordability and Accessibility</i>	“I think ICAPs are all fine and good, but you can only serve so many people with an ICAP, but there are thousands of patients with aphasia each year.”	“So us being based in Boston we traditionally have people move for a semester or two depending on the length of treatment for them. For those who couldn't relocate for financial or logistical reasons, they just simply couldn't get the treatment.”	“He's in a wheelchair that's uncomfortable. He has some continence issues which we just are not equipped to deal with unless he brings an aid and there's no funding for an aid with him. So I think that's the first one there's been an incontinence barrier, but other kinds of physical and stamina related barriers have come up.”
<i>Programmatic Funding Challenges and Economics of Healthcare: Staffing Models</i>	“It's hard because people also have lives outside of the profession and they want to take vacations and so I think early on just being really clear on the level of commitment that's	“When taking on the project there was just a lot I had to do ... You end up having to sometimes take on a little more than you'd like to when the program is in a growth stage. I think that I	“We see a lot of counseling needs that folks are not being served because either the counselor or the psychologist doesn't really know about aphasia so they can't serve them.”

	required to make it a valuable experience for both of our students and for our clients and their families. I think that that is invaluable there.”	would advise emerging ICAPs and myself to take advantage of the fact that a lot of us are in positions where there are students around us. So delegate opportunities for learning.”	
<i>Programmatic Funding Challenges and Economics of Healthcare: Secondary Costs</i>	“He's in a wheelchair that's uncomfortable. He has some continence issues which we just are not equipped to deal with unless he brings an aid and there's no funding for an aid with him. So I think that's the first one there's been an incontinence barrier, but other kinds of physical and stamina related barriers have come up.”	“I think there is not too much to add to this. I'd love to have more integration of the relatives and caregivers. But this is a bit difficult because people come from all over [X] and they cannot be there for six weeks.”	“But it's a geographically diverse province so it's very difficult for some people to just get here to [X] where we're based and stay here because of the accommodation costs and all that and just transportation issues.”
<i>Programmatic Funding Challenges and Economics of Healthcare: Funding Sources</i>	“So, because it was online and because we bill our services - we utilize insurance to pay for the services, our Medicare clients have to be supervised 100%. Folks that are private pay, they can be supervised and we do generally like a 50-50.”	“But I think the most challenging barriers are actually the financial situation at the hospital because the length of the program depends on how it's financed from the government. Since it's cost-free for the patients the hospital has to make some money by how the government is paying for inpatients. And at the moment they usually pay for up to a two weeks stay, but we have three weeks - the third week is not paid the same amount. Hence, at the moment,	“At the last minute before the presentation, I created an additional slide where we calculated the costs-benefit ratio of our program. How much does one unit of SLT therapy cost in comparison to a traditional rehab unit where patients are also three weeks, but only receive one to two units of 30 minutes SLT each week. And suddenly we were only half as expensive as the others, and that's when they [insurers] woke up. And when we told them

		<p>we are actually discussing changing the model to maybe add a two plus two weeks program with a break in between, because that will generate more money for the hospital. So it's typically economical and societal barriers.”</p>	<p>that basically doing once or twice SLT a week basically achieves nothing. So they are paying twice as much for zero results. That's when they woke up and changed their minds.”</p>
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